Videoconference hosters **WireOne's Glowpoint wins our evaluation of IP-based, QoS-guaranteed videoconferencing service providers. PAGE 49.**

NetworkWorld

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January 21, 2002 ■ Volume 19, Number 3

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Net mgmt. barrage set for ComNet

■ BY DENISE DUBIE

WASHINGTON, D.C. — Network management software vendors will launch a renewed enterprise push at next week's ComNet 2002 Conference & Expo with products designed to help companies make the most of their installed networks.

Retreating from the stalled service provider market, Aprisma, Micromuse, Opnet and many others (see graphic, page 14) will try to lure enterprise network executives out of the expected crowd of 30,000 attendees with a range of performance management and security management tools.

See ComNet, page 14

Top Web service worry: Security

■ BY JOHN FONTANA

■ The Home Depot and the Winter Olympics are making generous use of XML and Web service technology. Pages 12 and 25.

SAN FRANCISCO — The absence of security and reliability is proving to be a major stumbling block in convincing companies that Web services can thrive outside of corporate firewalls.

IT executives are finding that Web services technology can ease internal application integration. But for business-to-business integration, the technology is lacking key standards for enterprise-class transactions, according to experts attending last week's Next Generation Web Services Conference, which drew about 700 participants. Informal polls showed security was the top issue among those considering Web

See Web services, page 10

Debate flares over IP storage security

■ BY DENI CONNOR

Several industry giants are looking to standardize and strengthen the security of IP storage networks with a proposal whose implementation, experts say, may ultimately be expensive and unnecessary.

EMC, IBM, Cisco, Microsoft and others last month submitted a draft to the Internet Engineering Task Force (IETF) defining how they think IP Security (IPSec) should be implemented in storage devices — as single-chip ASICs, in software, or by deploying a VPN device in front of storage facilities.

The issue has become paramount now that IP — with the advent of Internet SCSi (iSCSI) and other IP storage technologies — is being used more often to transport storage information.

The group's action was spurred by a decree from the IETF's Internet Engineering Steering Group (IESG) last fall that requires storage devices to have IPSec authentication and encryption capability to be considered standards-compliant. Similar requirements cover other network gear.

"The IESG requires that security be part of any protocol

See Security, page 16

NEWSPAPER ■ $5.00

Vendors tout easier VPNs

Products rely on SSL rather than IPSec.

■ BY TIM GREENE

A new breed of products is emerging to rival traditional Internet-based VPN offerings that give remote users and business partners secure access to corporate networks.

The IP Security (IPSec) VPN alternatives promise to save customers vast amounts of administrative time by using easily configurable hardware and requiring little or no software on remote machines.

Among the companies pushing the products — which are based on the Secure Sockets Layer (SSL) technology found in most Web browsers — are start-ups Neoteris, NetSilica and Netilla Networks. While each newcomer is unique, they share a common goal of making VPNs easy to use and they all are passing on IPSec.

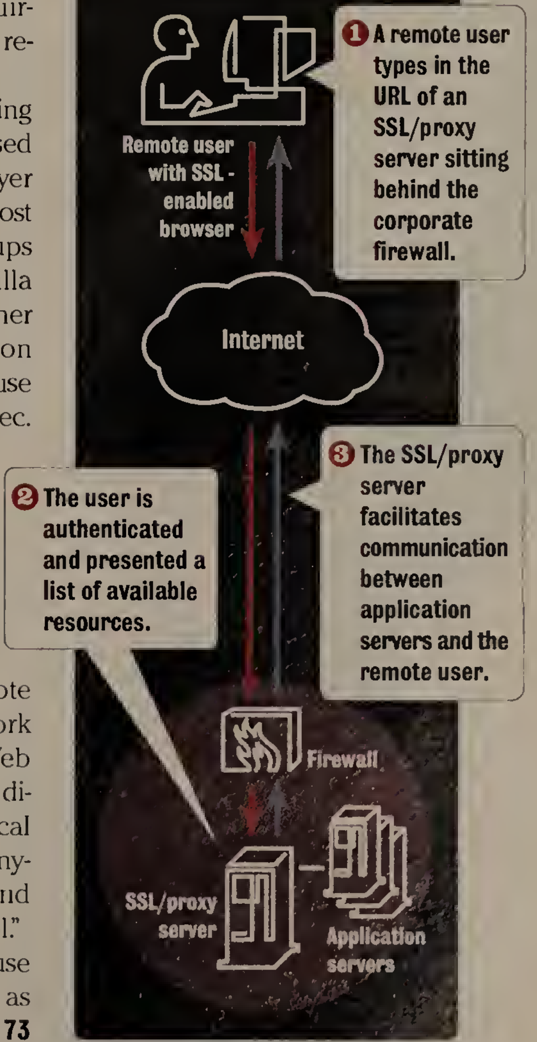
One customer says it took a half day to install and configure NetScreen Technologies' IPSec VPN client software on each of roughly 300 remote PCs. Switching to technology made by Neoteris meant the same remote users could access the network securely by using their Web browser, says Patrick Wilson, director of IT for Finisar, an optical components maker in Sunnyvale, Calif. "It's not a be-all and end-all, but it's a very good tool."

Part of the simplicity is because these new VPNs don't do as

See SSL, page 73

VPN alternative

Companies can simplify the setup of secure 'Net links by using new products that exploit Secure Sockets Layer (SSL) technology in Web browsers rather than installing IP Security VPN hardware and/or software at central and remote sites.



❶ A remote user types in the URL of an SSL/proxy server sitting behind the corporate firewall.

❷ The user is authenticated and presented a list of available resources.

❸ The SSL/proxy server facilitates communication between application servers and the remote user.

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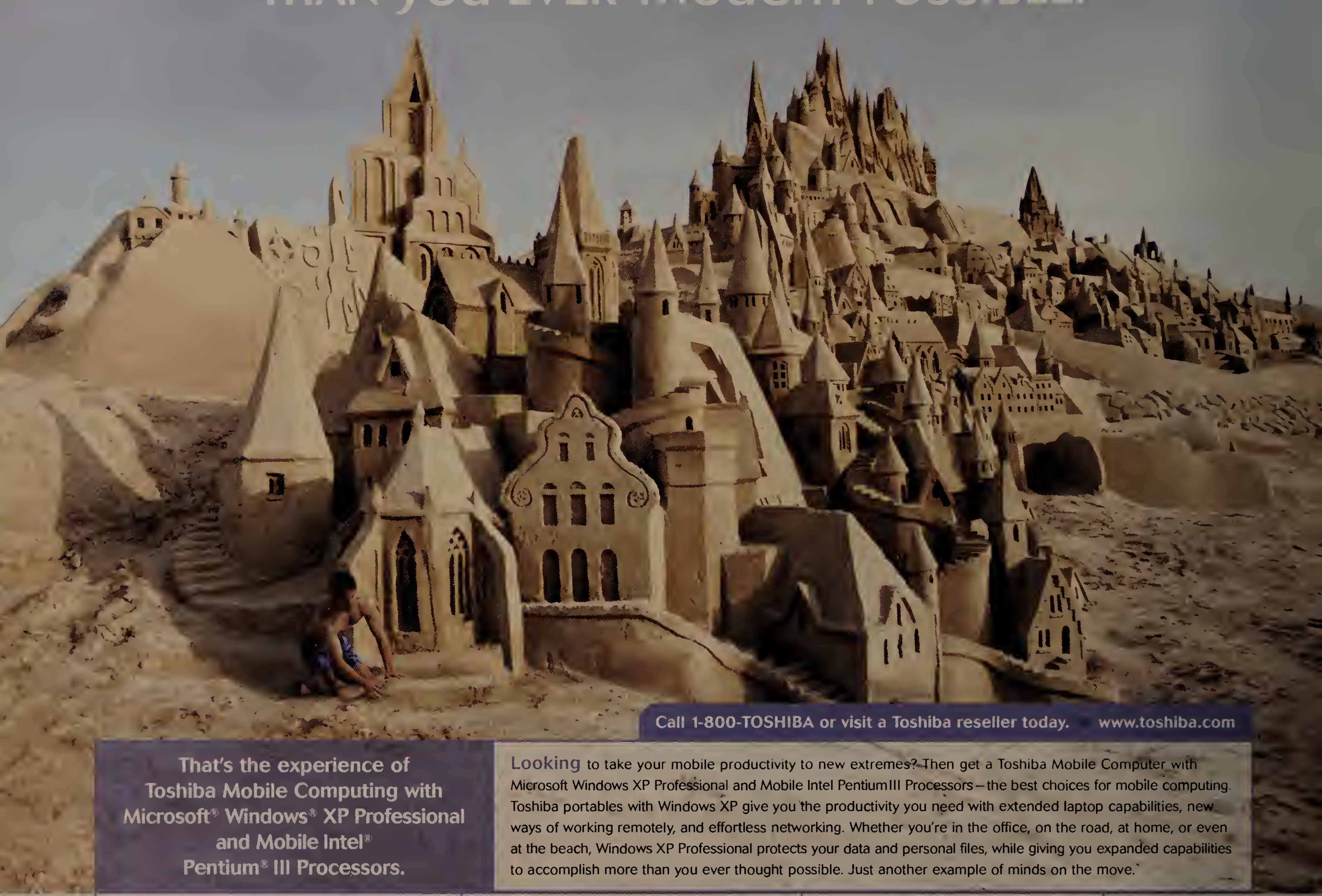

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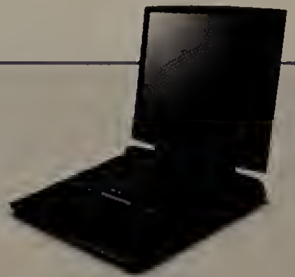

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1/21/02

NetworkWorld

News

- ■ **8 Technology group** outlines big-pipe dream.
- ■ **8** New carrier gateway from **Megisto Systems** aims to support wireless network roaming.
- ■ **10** With voice over IP up and running, companies look to **unified messaging.**
- ■ **12 Retail XML standards** take shape.
- ■ **12 The Home Depot** adopts **XML, Web services.**
- ■ **73** Start-up Flatrock pitches **IP Sec VPN alternative.**

Infrastructure

- ■ **17** Panel indicates that IP storage options are improving.
- ■ **17** RapidStream loads Check Point software on VPN devices.
- ■ **20 Kevin Tolly:** SIP incipient: Microsoft's Messenger move.

Enterprise Applications

- ■ **25** XML and Web services to share Olympic stage.
- ■ **25** YellowBrix aims at portal productivity.
- ■ **28 Scott Bradner:** The end of a bad idea?
- ■ **30 Special Focus:** Basics are still troublesome for application server customers.

Service Providers

- ■ **33** Conxion introduces caching services with pay-as-you-go pricing.
- ■ **33** Looking Glass focuses on a spectrum of metropolitan-area services.
- ■ **34 Regulatory Roundup:** Congress, FCC face a plate full of unfinished business.
- ■ **34 Johna Till Johnson:** Taking a look back at a few can't-miss technologies that sure did miss.

The Edge

- ■ **35** Switch maker unveils hybrid electrical switch fabric.

Technology Update

- ■ **37** Ring Spanning Tree brings resiliency.
- ■ **37 Steve Blass:** Ask Dr. Internet.
- ■ **40 Mark Gibbs:** True to type.
- ■ **40 Keith Shaw:** Home networks move to the living room.

Opinions

- ■ **46 Editorial:** Bluetooth home at last?
- ■ **47 Steven Taylor:** Defining the many faces of voice over IP.
- ■ **47 Winn Schwartau:** Cyber ethics in the workplace.
- ■ **74 Backspin:** Let's do IT with a dongle.
- ■ **74 'Net Buzz:** Microsoft's 'trustworthy computing,' Nielsen's site-map tips, and The Barksdale Group's abrupt exit.

Management Strategies

- ■ **55** Keeping costs in check: Five tips for squeezing more out of your IT budget.

PHOTO: MARK ROBERT HALPER

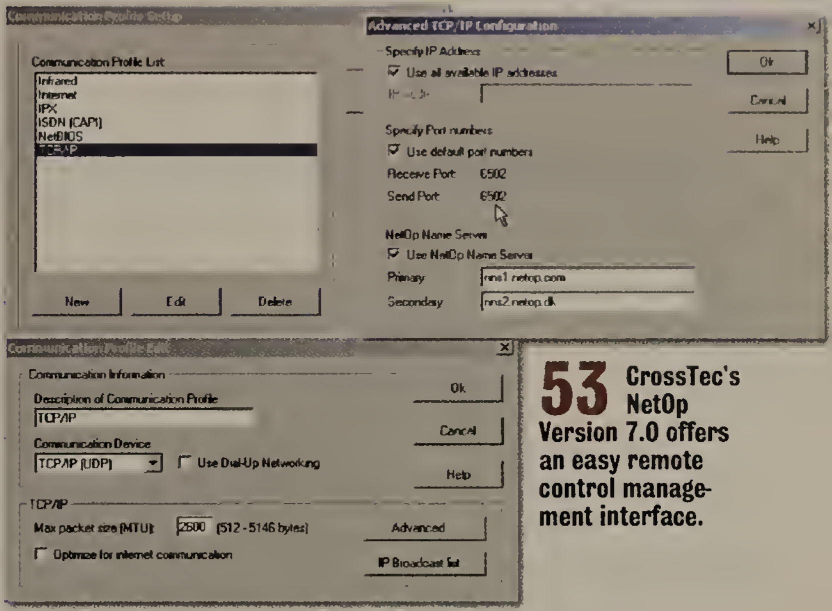
Features

Videoconferencing

Videoconferencing services come in two flavors: those that run on a private network or VPN and offer guaranteed quality of service, and those that run on the Internet and don't offer QoS. We tested them both. **Page 49.**

Review

CrossTec's NetOp Version 7.0 scores high marks as a remote-control tool. **Page 53.**


Communication Profile Setup
Communication Profile List
Infrared
Internet
IPX
ISDN (CAPI)
NetBIOS
TCP/IP
New
Edit
Delete
Advanced TCP/IP Configuration
Ok
Cancel
Help
Communication Profile Edit
Ok
Cancel
Help
Advanced
IP Broadcast list

Specify IP Address
☑ Use all available IP addresses
Specify Port numbers
☑ Use default port numbers
Receive Port 6502
Send Port 6502
NetOp Name Server
☑ Use NetOp Name Server
Primary nns1.netop.com
Secondary nns2.netop.dk

Communication Information
Description of Communication Profile: TCP/IP
Communication Device: TCP/IP (UDP)
☐ Use Dial-Up Networking
TCP/IP
Max packet size (MTU): 2600 (512 - 5146 bytes)
☐ Optimize for internet communication

53 **CrossTec's NetOp Version 7.0 offers an easy remote control management interface.**

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Forums

Grief or answers?

Shari Loback's and Mark Gibbs' recent columns have sparked a debate on the relevancy of vendor-sponsored online support forums. One of our readers says, "Sounds like you've never used Novell's online support forums, or haven't in a long, long, long time," and others agree. **DocFinder: 7740**

Interactive

Buyer's Guide

As a complement to our IP videoconferencing services review, this interactive chart provides a detailed look at some of the top service providers in this market.
DocFinder: 7741

Research

Videoconferencing online exclusives:

- Audio presentation on the basics of the technology.
- Tutorial and diagrams on recent IP videoconferencing standards.
- Primers and glossaries.
- Major resources.
- More links.

DocFinder: 7742

Columnists

Compendium

The tragedy of the dot-coms
Fusion Executive Editor Adam Gaffin uncovers two essays on how Google is effectively becoming the replacement for the domain name system. **DocFinder: 7743**

Home Base

Turning a manager's 'no' into a 'yes'
Columnist Jeff Zbar offers advice on the best ways to convince your boss to offer teleworking. **DocFinder: 7744**

NetSmart

Ways to learn on a shoestring

Events Editor Sandra Gittlen shares ways to stay informed without spending a lot of money. **DocFinder: 7745**

Events

NetSmart partnership

LearnKey and *Network World* now partner to offer IT training courses and certification exam simulations. Buy one LearnKey OnlineExpert Web-based training course at list price and get a second course of equal or lesser value free until Jan. 31. **DocFinder: 7757**

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News Bits

C&W purchase of Exodus gets legal OK

■ British telecommunications company Cable & Wireless last week received the go-ahead from a U.S. bankruptcy court to buy a majority of beleaguered Web hosting firm Exodus Communications, which filed for Chapter 11 protection last year. Exodus and C&W announced the deal in November and had been awaiting court approval. Under terms of the deal, C&W will acquire a majority of Exodus' business operations, including its brand name and intellectual property, for $850 million. Analysts say the deal will push C&W to the forefront of the Web hosting industry. The network service provider acquired managed hosting firm Digital Island in May for $340 million, adding 10 data centers to its 23 facilities. The Exodus purchase adds 30 data centers and about 3,500 customers, C&W says.

Palm ready to debut latest PDA

■ Palm is expected to unveil next week the successor to the Palm VII wireless PDA, which was released more than two years ago. Palm has been trying to stoke enthusiasm with e-mails and Web site pages. But users who can now compare Palm's products with those using the same operating system from rivals such as Handspring and Sony may be tougher to impress this time. The Palm i705 will feature a built-in antenna, unlike the VII's flip-up model. But the new PDA will also use Palm.Net, which is Palm's network of content providers, and messaging based on Cingular's cellular network. Users can expect three key innovations. One is an expansion slot, similar to that found in the newer m-series handhelds, which supports two postage-stamp-sized storage formats: Secure Digital and MultiMediaCard. Second is Palm's Universal Connector, for add-on components. Finally, the i705 will be able to constantly check for e-mail when the antenna is activated.

■ The Good The Bad The Ugly

Given the beating Compaq and Hewlett-Packard have taken since announcing plans for their marriage, it was nice to see a little good news out of Compaq this week, as the company posted a $92 million profit for its fourth quarter. That's a turnaround from a $672 million loss in the fourth quarter a year earlier.

3Com's going to have to change its name to 1Com or 2Com at this rate. The company last week said it is whacking 500 more jobs in the name of profitability, bringing its workforce total to 5,400 employees, less than half of what it had a year ago.

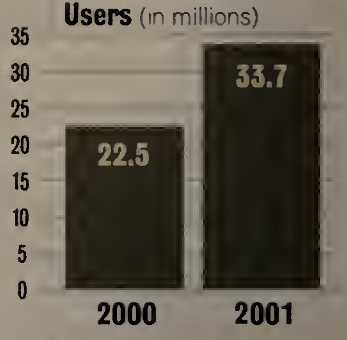
Filing for Chapter 11 bankruptcy protection continues to be all the rage. Following in the footsteps of service providers USinternetworking and Motient from earlier this month, Arch Wireless and Globix did the deed last week.

Internet use in China sees dramatic rise

■ The total number of Internet users in China hit 33.7 million at the end of 2001, increasing by about 50% over the previous year, according to the China Internet Network Information Center. The number of female Internet users has also increased, with women now constituting 40% of all Internet users in China. Internet users in China are predominantly younger than 35, with those between ages 18 and 24 constituting 36.3% of all Internet surfers, CINIC said.

Internet boom

More people in China are getting online.



SOURCE: CHINA INTERNET NETWORK INFORMATION CENTER

Akamai seeks injunction against Digital Island

■ Akamai Technologies is trying to shut down Digital Island's Footprint content delivery service as the patent fight between the two service providers continues. The motion for an injunction, filed last week, comes shortly after a federal jury in Boston found that Digital Island's Footprint content delivery network infringed on one of Akamai's patents. A spokesperson for Akamai says the motion for an injunction is aimed at Digital Island's Footprint 2.0 service. However, Digital Island says its Footprint 2.0 service does not include the technology that was found to be in violation of the patent in question. Akamai originally sued Digital Island in September 2000, claiming it violated a patent issued to Akamai a month earlier.

FreeBSD returns to its roots

■ The popular FreeBSD open source version of the Unix operating system is back under the control of one of its original developers after long-time sponsor Wind River Systems announced last week that it will divest its assets related to the freely distributed code. Wind River has transferred its FreeBSD development team and all its operations related to the operating system to open source software maker FreeBSD Mall, a newly named company led by Bob Bruce, who first distributed FreeBSD commercially in 1993.

Paul Otellini has been promoted to president and COO at Intel.

Otellini named president at Intel

■ Intel has promoted Paul Otellini, former general manager of the Intel Architecture Group, to president and COO. The 51-year-old executive becomes part of what Intel called its "two-person" executive office, along with Craig Barrett, the company's CEO. Barrett, 62, was also president until Otellini's promotion. Otellini will oversee the chipmaker's internal operations, including the development and delivery of new product.

Proxim, Western Multiplex agree to merge

■ Wireless LAN vendor Proxim has agreed to merge with Western Mulitplex, a builder of longer-distance fixed wireless bridges that was founded in 1979. The merged company will retain the name Proxim and will have products for building wireless LANs and connecting these wirelessly between buildings or across a campus. However, last week the stock prices of both companies plunged after news of the deal became public, reflecting investors' initial skepticism that the merger will create the LAN-WAN synergies touted by executives. Proxim sells its Harmony brand of IEEE 802.11b — and recently, 802.11a — wireless LAN access points and interface cards. Western Multiplex created the Tsunami family of wireless Ethernet bridges for 10Base-T, Fast Ethernet and Gigabit networks.

SAP pulls the plug on Commerce One deal

■ SAP last week called off its licensing agreement to jointly sell software with Commerce One, the struggling software maker that SAP has a 20% stake in. The companies formed an alliance in 2000 to go after the then-booming market for online business-to-business marketplaces and online procurement. As part of the deal, Commerce One and SAP said they would sell each other's online procurement software. Although they will no longer do that, SAP and Commerce One will continue to support and jointly sell their MarketSet online marketplace software.

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Lobbying group outlines big-pipe dream

TechNet calls on government to formulate national broadband policy.

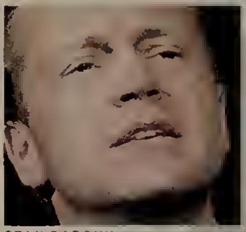
BY DENISE PAPPALARDO AND MICHAEL MARTIN

A plea last week by tech heavyweights for the federal government to make widespread broadband deployment a priority may have been somewhat self-serving and unrealistic, experts say, but it is also significant.

Beefing up broadband

Here are some of the principles TechNet believes should drive a national broadband policy:

1. Exercise regulatory restraint.
2. Encourage investment in broadband by removing regulatory disincentives.
3. Use a purely market-based approach when allocating wireless spectrum.
4. Allow tax incentives for broadband deployment in underserved communities.


STAN BAROUH

Broadband should be a national priority this century "just like putting a man on the moon was an imperative in the last century."

John Chambers
CEO, Cisco

The Technology Network, a lobbying group known as TechNet, is calling for the government to help make 100M bit/sec connections available to 100 million homes and small businesses in the U.S. by 2010. TechNet is backed by 250 technology companies including Cisco, Intel and Genuity.

Broadband should be a national priority this century "just like putting a man on the moon was an imperative in the last century," said John Chambers, CEO of Cisco.

The theme of TechNet's proposal is that with less regulation this seemingly impossible broadband dream could be achieved.

Less regulation appeals to Dale Witt, a product manager at IP Dynamics who makes recommendations about his company's broadband service.

"My motto is if you want something fouled up get the government involved," he says. There are some things the government does well, but creating more regulation for the high-tech industry is not one of them, he says.

While Witt says he's not looking for more government involvement in broadband deployments, he says the government should play a role in opening local networks.

"Today, there is a lot of finger-pointing between [regional Bell operating companies], ISPs and long-distance providers," he says. This is because RBOCs still control local copper lines even though users buy DSL service from other ISPs.

Industry experts agree. Currently, RBOCs have little incentive to roll out more broadband services because they have to share the networks they are building with their competitors, says Thomas Nolle, president of consultancy CIMI, and a *Network World* columnist. This cuts into RBOCs' profit margins and makes it difficult for them to justify spending money on broadband deployments.

"No one believes in their heart of hearts that the government is going to provide money for something like this," Nolle says. "But if a push for broadband is going to be achieved, you need some sort of government agenda, because it won't happen naturally."

Even if the government isn't paying for the broadband rollout, it should have some goals and policies in place that could help push deployment along, he says.

Rolling out a new fiber-based infrastructure, which TechNet proposes, will happen only if money could be made by doing so, Nolle says.

While TechNet believes more competition will help advance broadband, Lisa Pierce, an analyst with Giga Information Group and a *Network World* columnist, questions whether competition will solve the country's broadband problems. There was much competition during the competitive local exchange carrier boom, but those companies couldn't survive, she says.

"The fundamental question that has to be asked is how much of the market do you go after when trying to build these networks with massive amounts of capacity," Pierce says. If the government decides that 70% of the population must have access to 100M bit/sec service, the question is how do you pay for that, she says.

It's not clear if the group is recommending that the government come up with a plan similar to Universal Service, which requires phone companies to charge higher rates in urban areas to subsidize building out services in rural areas.

One thing that is clear is the vendors that presented the broadband policy recommendations would all benefit in varying degrees if 100 million homes and small businesses had access to 100M bit/sec services, Pierce says.

Moreover, the benefit of that kind of bandwidth isn't known today because applications that would eat up 100M bit/sec are not widely used. Consequently, the unknown costs of such a project are not justifiable, she says. There are also new compression algorithms being tested that may let traditional service providers get a lot more bandwidth out of existing networks, she adds.

TechNet's call for less regulation comes at a time when the provisions of the Telecommunications Act of 1996 are generating hot debate. Essentially, the telecom act forces incumbent providers to open up their networks to competitors if the incumbents want to be allowed to offer long-distance services.

Critics of the act have lined up behind the Tauzin-Dingell bill, which would remove many of the federal and state governments' abilities to force the incumbent carriers to open their networks. TechNet members say they are not behind the bill. The bill, which was put forward last year, is still languishing in Congress. ■

Carrier gateway set to support wireless network roaming

BY JOHN COX

A new gateway may soon make it possible for mobile workers to roam among existing and emerging cellular data networks as well as public-access wireless LANs.

The carrier-based gateway being developed by Megisto Systems of Germantown, Md., identifies a mobile subscriber, assigns a mobile IP address, and then tracks the subscriber's activities and net usage. The gateway uses this data, plus a set of interfaces to the carrier's existing network billing and service systems, to associate specific services with each subscriber and create a single bill.

While this kind of subscriber data is widely used in cellular voice nets today, Megisto's gateway appears to be the first product that extends this kind of provisioning to wireless data nets connecting to the Internet, including users accessing net services via a public wireless LAN (WLAN) in a convention center, airport or coffee shop. Enterprise users could log on to corporate data using a WLAN service at a convention center, and at another location, check their e-mail using a Code Division Multiple Access (CDMA) or Time Division Multiple Access cellular net, or in the future, a higher-bandwidth 3G net. All connections and services would appear on one bill.

In theory, the users could ignore any details of which radio technology was handling the connection. But that may take some time: Device makers will have to incorporate new code into their handsets, PDAs and portable computers to automatically detect spectrum changes. And the client devices themselves will have to include interface cards to each net, such as CDMA cellular nets and 802.11b WLANs.

ISPs and carriers building public access WLANs, sometimes called hotspots, have been forging billing arrangements so that each subscriber doesn't have to set up a different account, with a different logon and possibly a different configuration, for each provider. But these billing deals don't solve the problems created by the use of different wireless technologies, says Carol Politi, co-founder and

See Wireless, page 73

Be a Net Know-It-All

THIS WEEK'S QUESTION:

Lucent's new CEO, Patricia Russo, was most recently president and COO of which company?

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Unified messaging is making strides

BY PHIL HOCHMUTH

STEVEN VOTE

> **“It wasn’t really until after we had voice over IP in that we realized that [unified messaging] could be a pretty good thing for us.”**
>
> **Rock Regan,**
> CIO, state of Connecticut

Although analysts say unified messaging isn’t at the top of most users’ shrinking shopping lists, new products from the likes of Avaya and Cisco, and successful rollouts from early adopters, are moving the technology forward.

Cisco is counting on customers installing the technology in a big way, as evidenced by its announcement last week that the latest version of its Unity unified messaging system will support 7,500 users, an increase of 2,500. Version 3.1 also is designed to be more secure and work with more e-mail clients.

Separately, Avaya announced its strategy for integrating the Session Initiation Protocol (SIP) — an emerging protocol for unifying IP voice, video and real-time text chat communications — into future products. The company demonstrated SIP on its IP phones and IP PBXs at the International SIP 2002 Conference last week in Paris.

Unified messaging — software that ties voice and e-mail into a single user interface — has been around for years, but has gained momentum as voice-over-IP adoption has quickened. With phone and voice mail systems speaking IP just like e-mail in more networks, analysts say the barriers to unify the technologies are lower.

“Widespread adoption probably won’t happen for a few years,” says Robert Mahowald, an analyst with IDC, “but unified messaging will be the way everyone does business before long.” IDC predicts the number of unified mailboxes — now at 3.1 million in the U.S. — will increase sevenfold by 2005.

Government agencies haven’t always been held up as models of efficiency, but some public-sector IT departments are using unified messaging and voice over IP to try to change that image.

In Daytona Beach, Fla., Gene McWilliams, the city’s information services manager, just completed a voice-over-IP project that links his four IP-enabled Nortel Meridian PBXs to 23 offices via T-1 lines carrying voice and data. With voice over IP running, McWilliams took a one-month break, then rolled out unified messaging applications via Nortel’s CallPath product. The product, on roughly 400 city office desktops, delivers voice mail and e-mail to a single in-box.

McWilliams says users received the messaging software coolly at first, but warmed to features such as sorting voice mails on a PC screen and sending faxes from word processing applications. “It’s becoming the next ‘I need’ thing” among users, he says.

About 1,000 miles up the East Coast, the state of Connecticut is installing Cisco’s Unity product. The state made the jump to voice over IP last year more by necessity than by choice when a flood damaged its telecom equipment room and displaced the 240-person staff. Rock Regan, CIO for the state, chose voice-over-IP equipment from Cisco.

“Unified messaging wasn’t something that drove us” to go with voice over IP, Regan says. “It wasn’t really until after we had voice over IP in that we realized that it could be a pretty good thing for us.”

Over the next few months, Regan plans to roll out Unity to 400 desktops in various state offices. He expects the software to make state workers more productive and to make his department more efficient by setting up a unified help desk message system for the IT department with the Unity software. ■

Web services

continued from page 1

services.

Work is under way to develop protocols and mechanisms to strengthen the security, reliability and workflow capabilities of Web services, but some experts argue that they might not be robust enough or may overlap, and cause interoperability or integration problems down the road.

“It is foolish now to build Web services that run outside the firewall,” says John Studdard, CTO at VirtualBank in West Palm Beach, Fla. “We don’t know what level of exposure that represents.” VirtualBank developed a set of Web services interfaces to integrate data to produce fraud ratings for a credit fulfillment service.

“It’s just like in the days of putting up Web sites, Studdard says. The complexity was not putting up the site but getting the data to the Web. With Web services, the complexity is getting the data behind the Web service.”

Web services technology is being touted for its ability to transform application logic housed in disparate systems into components with XML-based interfaces. Those components can be integrated or aggregated into complex business applications or processes. The vision is that Web services from any number of sources could be dynamically combined over the Internet into hybrid applications for business-to-business commerce.

“The reality is way behind the vision at this point,” says Bob Marcus, CTO of consulting firm Emerging Technology Strategies.

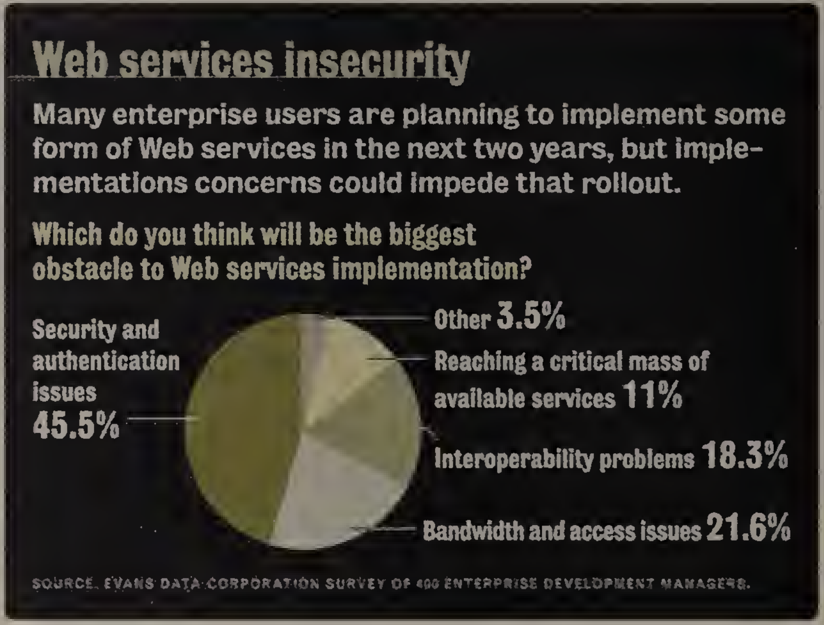
And to underscore the issue, Microsoft’s Bill Gates declared last week that “trustworthy computing” would become the top priority for the software giant, in large part to ease fears over the viability of .Net, the company’s Web services initiative.

“If you want to do real business processes, the keys are security, nonrepudiation and reliable messaging,” says Tim Hilgenberg, chief technology strategist for Hewitt Associates, which has built its own security mechanisms for a Web services interface it uses to provide data on corporate benefits. “You need guaranteed delivery. You need exception handling. The more complex the business process, the more security and guarantees you need.”

But with Web services, that scenario isn’t enterprise-ready.

“The issues become exponential and you open a Pandora’s box when you begin to connect Web services to multiple partners outside the firewall,” says Dana Gardner, an analyst with Aberdeen Group.

When corporations execute business-to-business commerce, which often involves machine-to-machine communication, certain behaviors are required. There must be assurances as to the identity of the systems, that messages are delivered once and only once, and that all business processes are completed.


Web services insecurity

Many enterprise users are planning to implement some form of Web services in the next two years, but implementations concerns could impede that rollout.

Which do you think will be the biggest obstacle to Web services implementation?

SOURCE. EVANS DATA CORPORATION SURVEY OF 400 ENTERPRISE DEVELOPMENT MANAGERS.

Web services specifications that begin to solve those problems are being developed now, including the Extensible Access Control Markup Language (XACML), Security Assertions Markup Language (SAML), XML Key Management (XKMS), XML Encryption, Web Services Flow Language, XML Digital Signature, Business Transaction Protocol and extensions to the Simple Object Access Protocol (SOAP).

Meanwhile, IBM has proposed HTTP-R for reliable transport of SOAP messages. And Microsoft is working on a Global XML Architecture, which includes proposed standards called WS-Security and WS-Routing. The Organization for the Advancement of Structured Information Standards is developing ebXML, which includes models for security and standardizing electronic business processes.

Others are proposing extensions to SOAP, which can carry directives in the header fields of its messages.

“By midyear you will see proposals for the next generation of SOAP that include a standard model for reliability and security,” says Adam Bosworth, vice president of engineering for BEA Systems, which develops the WebLogic application server. Bosworth says BEA is working with several major vendors, which he declined to name, on a “correlation” extension to SOAP that uses unique IDs in SOAP headers to ensure one-time message delivery.

But doubts remain.

“There is not an acceptable complete security model for Web services,” says Eduardo Fernandez, a professor in the Department of Computer Science and Engineering at Florida Atlantic University. “Right now, you have all these protocols for individual things, but how does it all come together.”

Fernandez says XACML and SAML don’t follow classic maps for security and might eventually produce errors, and XML Encryption and XKMS overlap in many places.

In the interim, a handful of vendors, including IBM, Microsoft, Kenamea, Sonic, Iona, Tibco, Flamenco Networks and Grand Central, are using a collection of standard and proprietary technology in middleware software or services that use security, reliable delivery of messages and transactional integrity of business processes exposed using Web services. However, most of that technology is still used between corporations that have already established a trusted relationship. ■

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Retail industry buying into XML

New XML schema standardizes method for digitizing store receipts.

BY ANN BEDNARZ

NEW YORK — Customers soon won't have to worry about misplaced proofs-of-purchase needed for warranty coverage or credit card disputes, and merchants will have an alternative to archiving transaction records, all thanks to XML-based digital receipt technology being developed by the retail industry.

The IXRetail digital receipt XML schema lays out a standard method for obtaining sales transaction information from multiple applications — such as point-of-sale, inventory and customer service — and making it available in an electronic format. The standard was unveiled last week at the National Retail Federation's annual convention by the Association for Retail Technology Standards and IXRetail, a partnership between ARTS and ActiveStore, a Microsoft-led retail technology initiative.

ARTS and IXRetail are among dozens of groups developing industry-specific standards for XML message structures. Their expertise is in defining vocabulary and functions unique to retailing. The challenge of such groups is to cover their territory while maintaining compatibility with other industries' XML standards, says Rita Knox, an analyst with Gartner. Credit card authorization and inventory checks are common to many industries, but it's a struggle to keep consistent the language used to define related XML tags, she says.

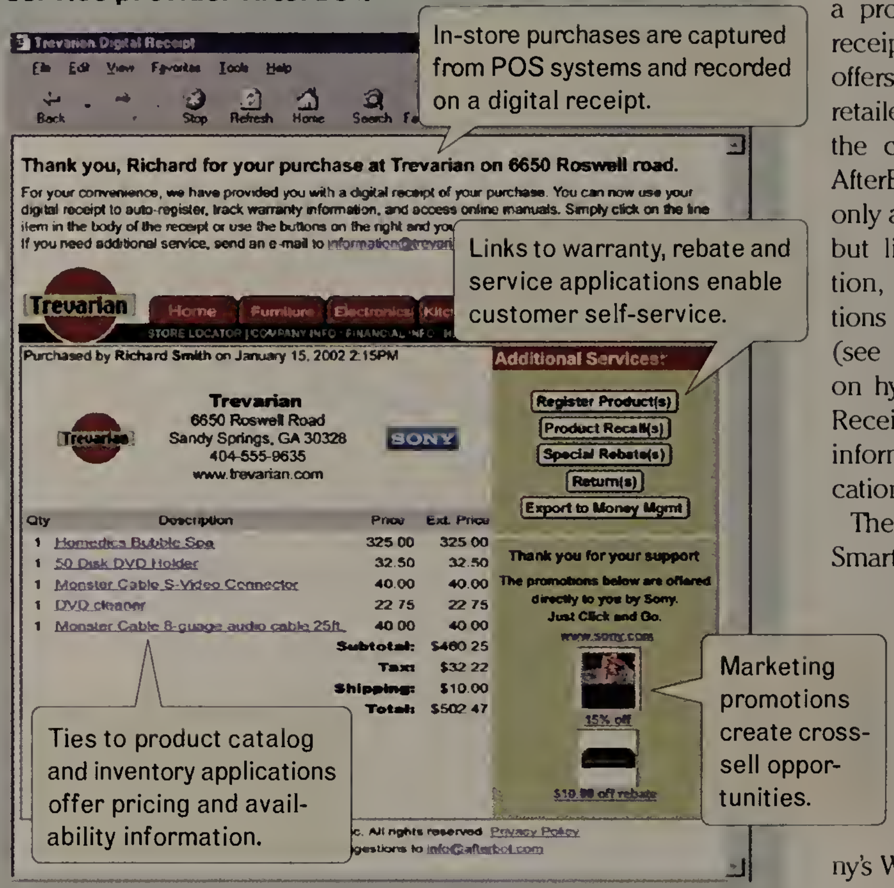
Digital receipts are intended for in-store purchases — most online sales already generate electronic documentation. The idea is that merchants will create digital receipts for consumers and suppliers, who can retrieve the digital receipts online and export the data to their own financial applications. Retailers can also use the digital records for their archives of in-store POS transaction data. Eventually, when purchases are made with a PDA or a cell phone, merchants can "beam" electronic payment receipts to the handheld devices. The Infrared Data Association is incorporating the IXRetail digital receipt into its upcoming "point and pay" standard for payments made by digital credit card and using handheld devices. Infrared technology will transport the digital receipt data between the handheld and the POS terminal.

One of the first vendors to offer a product based on the digital receipt schema is AfterBOT, which offers its ReceiptPLUS service for retailers that want to outsource the creation of digital receipts. AfterBOT's plan is to provide not only a record of items purchased, but links to warrantee information, customer service applications and marketing campaigns (see graphic). When users click on hyperlinks in the receipt, the ReceiptPLUS application retrieves information from the linked applications using XML messages.

The first ReceiptPLUS user is Smart & Final Stores, a 233-store warehouse grocery retailer in Commerce, Calif. For Smart & Final, the digital receipts are a customer service perk. Customers can securely view receipt details and other purchase information on the company's Web site, says Bob Graham, a vice president at Smart & Final. ■

Digital receipts

XML messages populate digital receipts with data from applications such as inventory, customer service and point of sale. This is an example of a digital receipt from service provider AfterBOT.



In-store purchases are captured from POS systems and recorded on a digital receipt.

Thank you, Richard for your purchase at Trevarian on 6650 Roswell road.

For your convenience, we have provided you with a digital receipt of your purchase. You can now use your digital receipt to auto-register, track warranty information, and access online manuals. Simply click on the line item in the body of the receipt or use the buttons on the right and you
If you need additional service, send an e-mail to information@trevari

Links to warranty, rebate and service applications enable customer self-service.

Purchased by Richard Smith on January 15, 2002 2:15PM

Trevarian
6650 Roswell Road
Sandy Springs, GA 30328
404-555-9635
www.trevarian.com

Qty	Description	Price	Ext. Price
1	Homedics Bubble Spa	325.00	325.00
1	50 Disk DVD Holder	32.50	32.50
1	Monster Cable S-Video Connector	40.00	40.00
1	DVD cleaner	22.75	22.75
1	Monster Cable 8-guage audio cable 25ft.	40.00	40.00
	Subtotal:		$460.25
	Tax:		$32.22
	Shipping:		$10.00
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The Home Depot's latest project: XML, Web services

BY ANN BEDNARZ

NEW YORK — The Home Depot is set to launch a pilot of its new point-of-sale system, which would replace four sales applications the company maintains in about 1,300 stores.

After searching unsuccessfully for a packaged application with the functionality it needed — and being a build-it-yourself-type of store — The Home Depot built its own using a Java-based architecture from 360Commerce. "A difficult road to choose, believe me," Ray Allen, senior IS manager at The Home Depot, told attendees at last week's National Retail Federation show.

At the core of The Home Depot's development strategy are XML for defining data to be shared between applications and Web services for breaking up monolithic applications into reusable components.

The simplicity and flexibility of XML helps reduce integration costs and development time, even when linking legacy systems, Allen said. "Because the data format is so simple, you can go to a mainframe COBOL application, generate an XML document and ship that out over the wire. And suddenly now you're accessing data that was embedded in an old application for a long period of time."

The Home Depot's existing POS environment is highly customized and tightly coupled with multiple store systems, including tool rental and special orders. It works well, but The Home Depot found it tough to tailor the system to respond to business changes.

Information-sharing requirements are getting more complex and business practices are changing — which requires IT systems to provide better functionality and greater flexibility across different platforms or else risk losing their value, Allen said. Each business change required the development team to alter four POS applications, written in different languages. "The flexibility just wasn't there," he said.

Also driving the need for the new POS system is The Home Depot's desire to synchronize information from different sales channels, including special order, phone and Web systems, and share consistent information with consumers and marketing staff.

"For as long as I've been in this industry we've been talking about eliminating some of the silos — information silos and business functional silos. It's not really happened," Allen said, but "we're at least getting to the point where we're defining business practices that cross those silos."

That's where Web services come in.

With Web services and XML messaging, companies can isolate — and then reuse — software components that handle specific tasks. The new POS system will replace the four existing systems, and its component-based design will take business changes more easily than packaged applications.

The Home Depot's existing POS, tool rental and special order systems don't have common code, but share common functions such as price lookup, tax calculation, tender management and returns authorizations. Allen and his team worked to isolate those tasks in Web services that combine existing application functions and "what we foresaw coming in the future," Allen said.

Each component is designed to be developed, tested and deployed independently of the applications. The Home Depot says it hopes to purchase these kinds of Web services rather than develop each component.

The Home Depot also uses XML to keep its orders and customer information in synch between the Web site, stores and its central customer database. When a Web order is placed, the company uses XML documents and messaging over HTTP to send the order to be processed in a specific store — for accountability purposes and to make sure the Web site wasn't competing with any particular stores, Allen says.

In one instance, The Home Depot didn't want to change the mainframe system it used for creating special orders for window blinds. It was a complicated system that worked well. So The Home Depot kept the order processing tasks on the system and used XML documents to send the completed transaction data to a store for tracking purposes.

"It's fast, it's scalable, it's flexible. And the content of the information can be adjusted as we need to, with very little effort. A lot of our architectures are going in this direction," Allen said. ■

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ComNet

continued from page 1

Overall IT spending is expected to be up slightly this year, from $750 billion in 2001 to $779 billion, according to analysts at Giga Information Group. But service providers' IT spending is expected to drop $1 billion, to $50 billion this year.

While enterprise companies are spending, they are spending more on software and services, and less on hardware. That means the pressure is on to do more with networks already in place.

"There is an overall trend of trying to do more with less — or at least do as well with less," says Jean-Pierre Garbani, a Giga analyst. "Enterprise network managers must find ways to deliver better or equal IT service and performance without investing in more hardware."

Opnet hopes to tap enterprise users looking to eliminate performance problems with software that shows users in real time where network devices — such as servers and routers — are being over- or underutilized. For example, VNE Server can help users optimize their network infrastructure by showing where to reroute traffic when servers or switches slow down, Opnet says.

Working with network management platforms, the VNE Server collects and correlates performance, configuration and topology data, and generates reports showing bottlenecks and what services or users are affected. The company will debut the beta-test version of VNE Server at the show.

Compuware also plans to woo attendees by making its Application Triage Program generally available. In the program, Compuware has combined its suite of Vantage performance management products with its professional services. For a fee of $10,000, Compuware will identify and solve performance issues on customers' networks. Compuware will let customers know within three to five days why their network is performing poorly and advise if applications should be rewritten or if the network needs reconfiguring.

Doing more with less also means merging important functions like security control with existing management systems.

"Any IT investments must prove to go a long way now, so users are consolidating previously unrelated IT functions within their departments," says IDC analyst Paul Bugala. "In turn, vendors are tightly integrating network security and management, and giving users one point of control."

Micromuse and Aprisma also plan to introduce security management products at ComNet.

Micromuse takes its first step into security management with Netcool for Security Management. This bundle of new releases of Micromuse software will debut probes for Check Point Software and Cisco firewalls. The company also configured its Netcool probes to be aware of security events and also customized its Syslog Probe and Multi-threaded Trapd Probe for security. The company also enhanced its Netcool fault management products with "off-the-shelf" security policies and reports.

> **"There is an overall trend of trying to do more with less — or at least do as well with less."**
>
> **Jean-Pierre Garbani**
> Giga Information Group

Aprisma will show attendees Spectrum Security Manager 1.2, the second release of the product that gives users tighter integration into the Spectrum management console. This release extends further into security the modeling capabilities of Spectrum, letting users model the security environment for remote locations or customer sites.

More performance news will come from these vendors:

- System Management Arts (SMARTS) will highlight the latest revision of its Service Assurance Manager software, SAM 2002, now with 18 new adapters. The adapters track outages and the users or services affected. The adapters plug SAM into network management systems, such as Tivoli Systems' Enterprise Console or Hewlett-Packard's OpenView, and network devices from vendors such as Cisco, Nortel and Lucent. SMARTS will also release security adapters to help users track events across security tools, such as firewalls and VPNs.
- Response Networks will add to its ResponseCenter 3.0 performance management software passive monitoring capabilities that let users pull performance metrics from Microsoft Internet Information Server, Microsoft Active Server Pages, Allaire Cold Fusion and Microsoft SQL Server. The company also added the ability to set thresholds on metrics such as CPU utilization, jitter rates and DNS lookup times.
- Hardware appliance vendor Niksun will unveil software called NetX that gives users centralized control and automated reports of the data collected by its NetVCR performance management box. ■

Net management news

ComNet 2002 will be a showcase for new software and hardware tools and services designed to help manage networks.

Company	Product	Description	Price
Agilent Technologies	FrameScope 350	Handheld network performance analyzer and cable configuration tester.	From $6,000 to $8,000 depending on the configuration.
Apogee Software	NetCountant Accountability 4.0	Billing software tracks enterprise IT usage based on department for chargeback purposes.	From $250,000 to $1.5 million
Fluke Networks	OptiView Workgroup Analyzer	Network monitoring appliance collects RMON2 data and captures packets for workgroups, server farms or remote offices.	$10,000
Matrix.Net Systems	Matrix Insight Surveyor and Matrix Insight Reporter	Hosted Internet optimization and performance measurement service designed to track service-level agreements for companies.	Surveyor, $100,000 to $450,000; Reporter, $3,000 to $30,000 per month.
Phonetics	Sensaphone IMS-4000	Network management appliance monitors IP addresses and physical network elements, such as power sources and temperature, for remote and branch offices.	$2,000
Teltronics	Site Event Buffer	Dedicated hardware monitors datacom network elements and legacy communications.	$2,000

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Correction

■ The story "Foundry shifts its switch strategy," (Jan. 14, page 8) should have listed the Foundry FastIron 1500.

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FLUKE networks

Security

continued from page 1

implementation that wants to claim conformance to newly approved [requests for comment]," says David Black, senior technologist at EMC and chair of the IETF's IP Storage Working Group.

Vendors interpreted that ruling to mean they must implement IPSec "in any IP storage device, gateway, host bus adapter or software driver, but it's up to the customer to turn it on if needed," says Cisco's Mark Bakke, who is a co-author of the group's draft specification. In fact most vendors indicate they implement IPSec as an optional feature in their equipment.

IPSec is a secure technology for implementing VPNs that authenticates and encrypts IP packets. Now that storage is using IP transport via iSCSI, Fibre Channel over IP and Internet Fibre Channel Protocol (iFCP), the IETF says the same security mechanism that protects IP networks should also protect IP storage. ISCSI defines universal access to storage devices and storage-area networks (SAN) over Ethernet-based TCP/IP networks. Fibre Channel over IP bridges two physically separated Fibre Channel-based SANs over IP, and iFCP is used to link Fibre Channel SANs with iSCSI networks or bridge Fibre Channel networks over the WAN or metropolitan-area network.

"Security has never been a big deal in storage before because hackers intrude on IP networks, not Fibre Channel," says Nate Rushfin, CTO of Bladeworks, a start-up network gear vendor. "All of a sudden an area that was previously unhackable is now vulnerable, and expensive business-critical data is at risk."

Fibre Channel networks are not as open to attacks because of the fiber-optic media they use and their isolation from the outside network. As each IP storage technology is deployed, the potential for attacks increases. Gartner estimates that attacks on IP networks will increase by a factor of 100 or more by 2004.

Implementing authentication on storage devices is relatively easy, as it is already part of the existing iSCSI specification, says Tom Clark, director of technical marketing for Nishan Systems. However, enabling IPSec encryption is harder, Clark says. Inspecting each packet and decrypting and re-encrypting them slows data transfer on the network and imposes an overhead for users who may not need security or already have their data protected with encrypted VPNs.

Rushfin, a former IT director for a municipal government, suggests that rather than implementing IPSec in hardware or software, he would prefer to deploy it in a more traditional way. "I'd use a PIX firewall or any Cisco switch, where the packet-switching architecture provides the isolation of customer from customer data," he says. PIX is Cisco's firewall and intrusion-detection software.

"Everyone agrees standardizing on how iSCSI uses IPSec is a good thing, but vendors need to choose for themselves whether adding the cost of IPSec is justified in any given product or installation," says Doug Ingraham, a Cisco marketing manager.

Bob Wheeler, an analyst for the Linley Group, says 1G-bit/sec IPSec ASICs will add as much as $600 to each Gigabit Ethernet or Fibre Channel adapter. Gigabit Ethernet adapters top out at about $200, while Fibre Channel adapters cost as much as $1,000.

Because adding the cost of IPSec ASICs to storage devices may not be realistic, vendors are likely to choose another implementation. ■

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Short Takes

■ **Inrange Technologies** last week released a Fibre Channel director-level switch with 256 ports for large companies deploying storage-area networks. The **IN-VSN FC/9000** switch is a redundant, nonblocked switch that supports E-Port interoperability, a standard that allows it to be connected and work with switches from other Fibre Channel vendors, such as Brocade.
Customers can use the switch to concentrate traffic from smaller fabric switches at the network edge. The box can be installed to support switched, arbitrated loop, public and private and point-to-point SANs. Pricing was not available. www.inrange.com

■ **Ingrian Networks** last week rolled out an upgrade to its **i140 Secure Sockets Layer transaction processing off-load appliance** that will give users more than five times the performance of its model 300 offering. Like other SSL off-load appliances, the i140 is designed to speed Web and e-commerce sites that require secure transaction processing.
The box works by taking SSL processing off the Web server, freeing it up for dynamic content processing or application-related tasks. The i140 typically sits in front of a Web server farm and behind a load-balancing switch that routes SSL transactions to it.
With the upgrade, the i140 gives users the ability to handle 1,600 transactions per second vs. the previous version's 300 transactions. The i140 is also compliant with the Federal Information Processing Standards 140-1. The FIPS 140-1 is a series of standards developed by the National Institute of Standards and Technology and issued by the U.S. government for cryptographic modules.
The upgrade is free for current customers.
www.ingrian.com

Panel: Storage options improving

■ **BY DENI CONNOR**

WESTON, MASS. — Storage experts say IP storage and performance advances present a variety of opportunities for enterprise customers who have not yet implemented storage-area networks.

That was the consensus of a panel on storage technologies held with speakers from companies including Pirus Networks, Nauticus Networks, Hewlett-Packard, EMC, Enterprise Storage Group and Charles River Ventures late last year. The group discussed a number of needs of which users contemplating storage networks should be aware, including improving performance and scalability, the evolution of IP storage and the need for storage standards.

To achieve those goals, Chris Baldwin, a partner with Charles River Ventures, suggested breaking apart tightly coupled systems to let each do what they are best at.

"Our data infrastructure is a layer of many pieces, each of them optimized unto themselves, but without a system view over them. We have parts that are good at networking, parts that are good at computing and parts that are good at storage," he said.

Baldwin supports optimizing individual technology components so much that he has funded Nauticus Networks, Pirus Networks and Storigen. These companies focus on increasing the performance of the storage component and alleviating I/O processing from the server so it can better run applications. Pirus makes a carrier-class switch that uses Fibre Channel and iSCSI to transport block and file-based data. Nauticus is developing an application-level switch for the data center that will focus on availability, performance, manageability, security and reliability.

Brice Clark, director of strategy at HP, agreed with Baldwin's assessment, but said a fourth component is missing.

"That's a data center operating system that lets applications run one after another, after another," Clark said. "The initiative to manage the data center is one that is key . . . so that you can expand and contract as demand changes. The system has to ultimately become dynamic. That fourth element doesn't exist today."

The industry is starting to look at adopting IP storage (iSCSI) as a mechanism to speed along data traffic. ISCSI involves the transport of SCSI data over Ethernet and, according to the panelists, will be one of the best ways to get data where it belongs for customers who have not yet implemented a SAN or those who need to bridge together existing SANs.

"When you look at the transition to iSCSI, the market is divided," said Richard Napolitano, president of Pirus. "People talk of edge connectivity for iSCSI, to send data across the country or ocean." Others will use it for direct-attached storage.

The panelists said despite the advantages of iSCSI, its adoption will not be any faster than Fibre Channel's or even Ethernet's were. ISCSI will follow a long, protracted road fraught with standards and

See Storage, page 20

PAUL FOLEY

A panel of storage technology experts recently looked at the future of storage nets. The group included (left to right): Bob Supnik, Nauticus; Ken Steinhardt, EMC; Tony Prigmore, Enterprise Storage Group; Richard Napolitano, Pirus; Brice Clark, HP; and Chris Baldwin, Charles River Venture.

RapidStream gets to the (Check) Point

Appliance maker bets on Check Point's name recognition by adopting its software.

■ **BY TIM GREENE**

SAN JOSE — RapidStream is betting customers will be more willing to buy its high-speed security gear if it runs big-name firewall-VPN software made by Check Point Software.

The company is revising its product line to support Check Point Next Generation VPN-1/Firewall-1 and pulling back on its own firewall and VPN software. Because Check Point certifies all of its hardware partners, the fast RapidStream box will interoperate with gear made by other Check Point partners such as Nokia, Sun and Compaq, says Jeff Phillips, an analyst with TeleChoice. Companies using Check Point-based gear that need more speed at some sites can get it by adding a faster RapidStream box.

This is good news for users who own Check Point supported gear but may need faster equipment at busy sites, Phillips says. "They're saying, 'We're the platform that can make Check Point run the fastest.'"

RapidStream says the move will give it a much-needed status boost.

"Our No. 1 problem is customers saying, 'Who are you and why do I trust you?' It's hard to get your name out there if you are a small company," says Vincent Liu, CEO of RapidStream.

Being able to say that Check Point — one of the most widely used firewall and VPN vendors — makes the software running on RapidStream eliminates that problem. Users would buy RapidStream appliances with VPN-1/Firewall-1 installed and pay Check Point a license fee to turn it on, Liu says.

"We looked at Check Point, Cisco and SonicWall when we were considering VPN equipment," says Thomas Wagenhauser, IT director for Harlan Bakeries in Avon, Ind.

See RapidStream, page 20

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TOLLY ON TECHNOLOGY

Kevin Tolly

SIP incipient: Microsoft's Messenger move

Like everywhere else in the world of technology, the high-visibility suites of videoconferencing, voice over IP, instant messaging and "presence" services are built upon arcane sets of standards.

As elsewhere, these are often competing sets of standards. While, fortunately, the end user remains blissfully unaware of the underlying architecture, it doesn't mean such matters are unimportant. And victories on the standards front can have significant implications down the road — witness the collapse of token ring and how that ultimately triggered the rearchitecting of virtually every corporate network.

Nothing can turbocharge existing momentum more than having a major vendor cast its lot with one side. Barely noticed amid the myriad issues surrounding the launch of Microsoft's Windows XP operating system was the tectonic shift from H.323 to Session Initiation Protocol (SIP) as the signaling protocol for its new converged messaging application called, appropriately and simply enough, Messenger. (Check out the SIP Center Web site at www.sipcenter.com for detailed information about the protocol.)

Just as the use of H.323 did not make or break Microsoft's legacy NetMeeting product, neither does the use of SIP have a gargantuan impact on the Messenger product. Yet, the overall quality of Messenger and, thus, its acceptance rate ultimately will have an impact — positive or negative — on the acceptance of SIP. Thus, we need to look closely at the product as a whole.

To understand Messenger though, one needs to understand NetMeeting. Launched as a new-generation messaging platform, NetMeeting met with limited success. Being forced to use H.323 as its signaling protocol certainly did not help. As SIP promoters will tell you, H.323 has complexity levels that are too high and flexibility levels that are too low. Any application, then, that is forced to use it gets to carry that same baggage.

But what was really wrong with NetMeeting was not the fault of H.323 but, rather, the fault of Microsoft. Specifically, its voice-over-IP endpoint latency was so inordinately high as to make it virtually useless.

How did I find this out? Microsoft said so. (I've since proven it to myself.) In its inimitable way, Microsoft warmed up analysts covering XP by self-bashing its previous-generation products. In so many words, Microsoft said NetMeeting was bad because its latency was excessive but that Messenger under XP fixed all that and exhibited remarkably low latency.

We looked at Messenger on XP and Windows 2000 (Microsoft brought out a version for that platform at the same time XP was launched), looked at NetMeeting's H.323 performance and ran identical benchmarks on H.323 and SIP IP phones from Siemens.

True to Microsoft's word, the NetMeeting latency was through the roof and the Messenger latency — not only on XP but on Win 2000 as well — was quite impressive. Those particular measurements were as good as or better than the IP phones. However, the overall experience as measured in terms of voice quality did not match the IP phones.

Network executives might want to consider Messenger as an auxiliary method to deliver low-cost voice over IP, but they'd do well to take pause and realize that, contrary to what Microsoft seems to be implying, delivering quality voice over IP hinges on much more than a single latency benchmark number.

Tolly is president of The Tolly Group, a strategic consulting and independent testing company in Manasquan, N.J. He can be reached at ktolly@tolly.com or www.tolly.com.

RapidStream

continued from page 17

Check Point made the list because it had a reputation for reliability, he says, although the company wound up using ISA gear it had on hand.

RapidStream's new high-end appliance, RapidStream 11000, runs Check Point software faster than appliances made by other hardware vendors. RapidStream 11000 tops out with a VPN speed of 1.2G bit/sec and a firewall speed of 2G bit/sec. Nokia, the major appliance vendor that Check Point software supports, tops out with a firewall speed approaching 2G bit/sec but VPN support of only 150M bit/sec, according to Check Point.

RapidStream is the first vendor to take advantage of a new Check Point API called XL, which is designed to speed the performance of the software by supporting use of custom security processors. RapidStream's hardware uses custom processors called RapidCore that offload VPN and firewall processing from the CPU of its equipment, boosting throughput.

Warp speed

RapidStream's new 11000 suports Check Point's Next Generation firewall/VPN software.

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- **Firewall speed:** 2G bit/sec
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- **Sessions:** 600,000
- **Price:** $95,000
- **Available:** March

Competitor NetScreen Technologies has a similar architecture and runs its own VPN and firewall software, Phillips says. Teaming with Check Point could give RapidStream a leg up on NetScreen, he says. Other vendors such as Cisco use general processors but also make add-on processor cards to speed VPN encryption.

RapidStream is loading Check Point software on its existing appliances and changing their names. So the RapidStream 2000 with VPN-1/Firewall-1 becomes RapidStream 2100; RapidStream 6000 becomes RapidStream 6100; and RapidStream 8000 becomes RapidStream 8100.

RapidStream 11000 will be available in March and will be demonstrated at ComNet 2002 later this month. It costs $95,000. RapidStream 2100 and 6100 are available now and cost $5,000 and $15,000, respectively. RapidStream 8100 will be available next month for $35,000. ■

www.nwfusion.com

More online!

The Network World Global Test Alliance reviewed RapidStream's biggest competitor, NetScreen. See how the NetScreen 500 firewall/VPN appliance fared. Also get a *Network World* vendor profile with breaking news on Check Point.

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Storage

continued from page 17

interoperability issues.

"[ISCSI's] adoption rate is going to be somewhat slower because the silicon necessary to make that incremental leap above Fibre Channel to 10G bit/sec throughput is nontrivial," said Bob Supnik, CTO for Nauticus. Vendors such as Trebia Networks and Adaptec make ASICs for TCP Offload Engine and iSCSI, which will speed I/O processing.

EMC said iSCSI, Ethernet and Fibre Channel vendors have a lot to learn from each other.

"Fibre Channel was developed because Ethernet couldn't handle storage traffic adequately. It was still struggling with 100M bit/sec [throughput] and 10Base-T connections — Ethernet was just barely making the transition to switching," said Ken Steinhardt, director of global marketing at EMC. "Ethernet has come a long way, largely benefiting from Fibre Channel's [development] of gigabit technology, which it basically absorbs."

Most panelists said Fibre Channel and iSCSI are complementary rather than competitive technologies.

"ISCSI will probably help Fibre Channel before it ever eats into Fibre Channel because it presents a choice to people and the ability to deliver storage services over a fabric that they already own that's extensible in the metro area and the wide-area environment," Clark said. "ISCSI is a technology that can connect all kinds of existing storage, including Fibre Channel storage, into this fabric."

Baldwin said there is a lesson that can be learned from Cisco, one of the leaders in IP networking.

"When I look at where we are in the storage world, it reminds me a lot of when Cisco first appeared," Baldwin said. "Cisco said, 'You've got token ring, Ethernet WAN links; you have TCP and DECnet — which one is going to win out?' Did Cisco win the bridge vs. router war because it made better routers? No, it was because it made both switches and routers. In the storage world, we have to acknowledge that we have Fibre Channel, SCSI and iSCSI. Someone needs to help customers build infrastructure out of them."

> **"Even though I have only 16 years in the storage business, I've never met a customer that bought a storage product of any kind because of a standard."**
>
> **Tony Prigmore,**
> Enterprise Storage Group, analyst

Despite the issues iSCSI has, standards do not appear to be one of them.

"Even though I have only 16 years in the storage business, I've never met a customer that bought a storage product of any kind because of a standard," said Tony Prigmore, an analyst with Enterprise Storage Group.

That's one point on which all the storage experts agreed.

"It comes down to what works and what is actually able to solve business problems," Steinhardt said. "We have several customers that interconnect EMC storage, legacy Hitachi storage, IBM tape drives and Brocade switches together with four different operating systems. Their installation isn't standard, but it works." ■

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InSite: Lessons from Leading Users

XML, Web services to share Winter Olympic podium

■ BY JOHN FONTANA

Every Olympic year the Games provide the opportunity for athletes to prove they can turn in championship performances under the pressure of premier international competition.

At next month's Winter Games in Salt Lake City, SchlumbergerSema, the technology service company behind the Olympic network, hopes to prove that XML can handle that same pressure with the grace of a figure skater, the speed of a bobsledder and the accuracy of a biathlete.

And in the 17 days of Olympic events, IT executives will get a battle test on XML and Web services, middleware or application code, based on a collection of XML-based protocols, as a key integration technology for corporate systems.

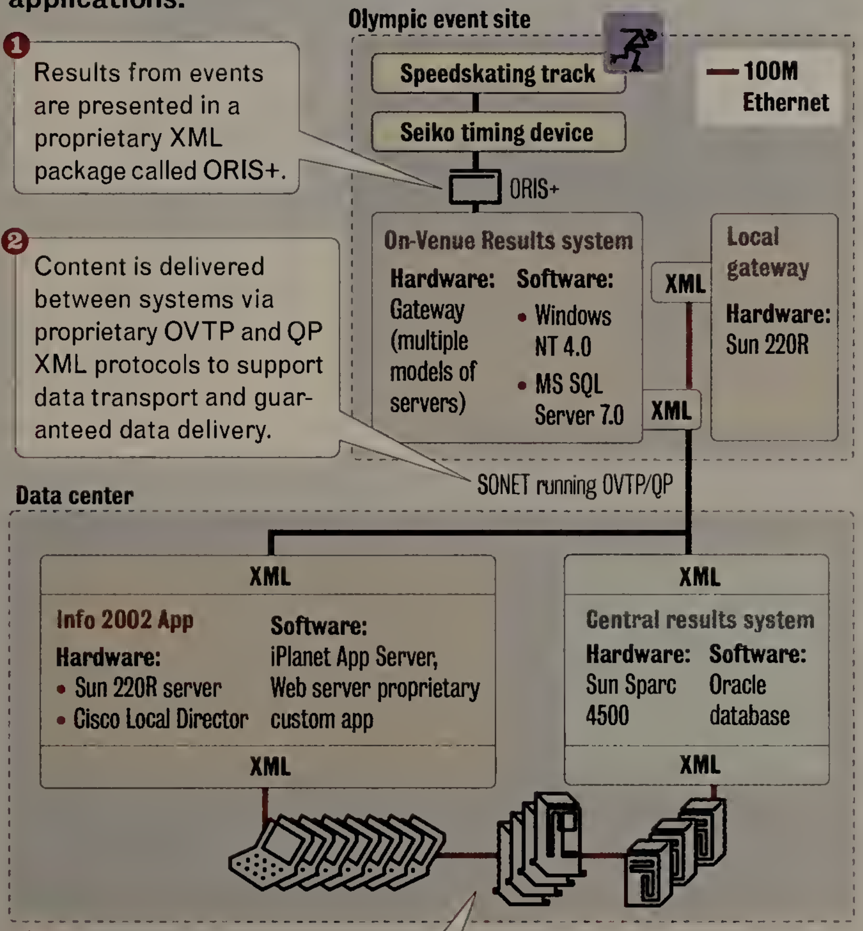
"The unique aspect of our network is the massive amount of integration," says Jason Durrant, director of system integration and technology for SchlumbergerSema. "We have been building and testing it for three years."

SchlumbergerSema, which this year replaces IBM as the architect of the Olympic network, used XML to integrate 30 disparate systems that tie together everything from timing/scor-

See Olympics, page 28

An Olympic effort

For its Olympic network SchlumbergerSema used XML to integrate everything from timing/scoring devices to custom applications.



① Results from events are presented in a proprietary XML package called ORIS+.

② Content is delivered between systems via proprietary OVTP and QP XML protocols to support data transport and guaranteed data delivery.

③ Results, news, weather and travel information are used in more than 40 applications and presented on about 4,500 workstations and laptops, 225 servers and 145 Unix boxes.

YellowBrix aims at portal productivity

■ BY CAROLYN DUFFY MARSAN

All dressed up and nowhere to go. That's how many companies find themselves after rolling out Web portal packages, which offer snazzy user interfaces but little ready-to-display information.

Enter YellowBrix. The company offers a combination of automatic content-classification software and Web syndication services that help companies fill Web portals with targeted information from internal and external sources.

YellowBrix uses artificial intelligence to classify and summarize volumes of textual information with its flagship offering, ArchiText Information Management Solutions. In August, YellowBrix bought iSyndicate Content Solutions, which delivers a real-time Web news service that is categorized into vertical industries.

YellowBrix has integrated the two offerings and packaged them into hosted services and licensed software for populating Web portals. The company has developed plug-ins for portal packages from Oracle, IBM, SAP, Epicentric and others.

In February, YellowBrix will ship a new version of ArchiText that adds contextual recommendations for content classifications, similar to the technology underlying search engines. The pricing for a licensed version of ArchiText is between $80,000 to $100,000.

YellowBrix has created a new term — automated information provisioning — to

See YellowBrix, page 28

Short Takes

■ IT services and consulting firm **Accenture** and software maker **Siebel Systems** last week forged an alliance to target public-sector agencies worldwide. Promising new features, lower costs and faster time to market, the companies said they would offer and install Siebel's customer relationship management software. The companies will target any public-sector agencies but will focus on postal, tax and revenue management and entitlement program agencies, the companies said. Customers in the U.S. include the Florida Department of Business and Professional Regulation and the U.S. Department of Education. Siebel's software is designed to create one source of information within an organization. That information then can be made accessible through multiple channels, including the Web and telephone, according to Siebel and Accenture.

■ In a move intended to give users voice-based, wireless access to a range of applications and databases, **Oracle** last week announced the acquisition of voice portal company **Indicast**. Oracle plans to offer Indicast's voice application technology as a hosted service and will integrate the technology into future releases of Oracle9i Application Server, the company said. Indicast's voice portal technology will also be integrated into Oracle E-Business Suite and Oracle online services, such as My.oracle.com. With the acquisition of the Indicast, Oracle plans to offer customers many voice-based services, including private-label voice portals and VoiceXML session enhancement.

"Waiter! There's soup on my fly!"

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'NET INSIDER

Scott Bradner

The end of a bad idea?

Not long ago Nortel's $19 billion paper loss in just three months set a standard for fiscal prowess that other businesses could only wonder about. Now Enron has one-upped Nortel by losing about $23 billion in the last quarter of 2001 on top of a $68 billion loss for the rest of the year.

And these Enron losses were not the paper "goodwill" types of losses like Nortel's were — this referred to the actual value of shares on the New York Stock Exchange. Enron topped off an impressive 2001 by declaring bankruptcy, the largest in history. I wonder who will try to top this?

One of Enron's big things was acting as a broker. The company inserted itself between the producers and consumers of some commodity, such as electricity. Apparently the producers and consumers liked the arrangement because Enron was very successful at this — accounting, for example, for as much as one-quarter of the energy trading in the U.S. even though it never produced that much energy on its own. Enron was a very successful company, claiming annual revenue at its peak in excess of $100 billion.

The Enron Web site (www.enron.com) lists 32 product areas from power to fertilizers (there must be a lesson in that last category but I won't go there). This column only concerns one of Enron's product areas: bandwidth.

At first glance, brokering and selling bandwidth seems like a reasonable Idea, but I'm not sure that its time has come, if it ever will. Enron's online slide show explaining its idea of bandwidth trading (www.nwfusion.com, DocFinder: 7732) starts with a quote from Machiavelli about the lukewarm support new ideas get from the Establishment. What it does not mention is that some ideas deserve lukewarm or no support because they are bad ideas.

Enron's model of bandwidth trading was to permit companies to get network bandwidth between aggregation points when it was needed and for the length of time that they needed it. This bandwidth could be used for special events such as televising sporting events or to augment an existing network. The company felt there was an opportunity in this area because of the inflexibility of the traditional players in the field. Historically, one purchased bandwidth in fixed-sized chunks for extended, often multiyear, periods, which took months to negotiate and provision.

But there are a few problems with Enron's idea. First, much of the problem with bandwidth these days is that it does not exist just where it is needed (no fibers), and second, the traditional model is dying. IP-based connectivity is easy to get and can satisfy most requirements. You do not need dedicated connections for all but the most demanding applications. It is hard to see how one can make a viable business model out of satisfying just these niche cases.

The bandwidth trading concept was bankrupt long before its champion.

Disclaimer: Bankruptcy is not a common topic at Harvard (well, maybe at the law school), so the above is my own opinion.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@sobco.com.

Site: Lessons from Leading Users

Olympics

continued from page 25

ing devices to custom applications to the participant management system. The network, which uses SONET on the WAN and 100M-byte Ethernet on the LAN, spreads across 40 Olympic venues, two data centers and a mission-control facility in and around Salt Lake City.

"It is mainly a data distribution network," Durrant says. "We calculate some rankings at the event site, but the key is distributing event data throughout our systems."

The Olympic network includes 40 applications, 4,500 workstations and laptops, 225 servers, 145 Unix boxes and 32,000 miles of fiber-optic cable. It is run by 3,000 IT staff during the Games.

Where IBM took a mostly single-vendor approach, SchlumbergerSema has assembled a consortium of vendors, including Sun, Cisco, Microsoft, Oracle, Xerox, Kodak and Seiko, and tied their products together using custom-written transport protocols, queuing mechanisms and guaranteed delivery technology based on XML.

The project started more than two years ago when SchlumbergerSema began developing two XML-based protocols — the On-Venue Transfer Protocol (OVTP) and the Queuing Protocol (QP) — to support standards-based data transport and guaranteed data delivery between disparate systems.

SchlumbergerSema also developed a specification called ORIS+, an XML representation of the Olympic Results and Information Service (ORIS), which outlines how event results must be represented. ORIS+ defines the contents of XML data packets, which are then moved between systems using OVTP for transport and QP to guarantee delivery.

The model is similar to the Simple Object Access Protocol (message transport) and the Web Services Description Language (packet description), which are foundations of Web services technology. "OVTP worked well out of the box," Durrant says.

"Most of the real work was in the tweaking of the data content and XML tags used within different products," he adds.

Durrant says the specifications are being published within the International Olympic Committee so they can be reused, but that they will remain private, proprietary technologies.

SchlumbergerSema also created an XML "shim," software that provides an interface between 11 On-Venue Results (OVR) systems, which collect timing/scoring data and are built on Microsoft's Windows NT and SQL Server, and a centralized data-collection system based on Sun hardware and Oracle databases.

The data-collection system is integrated via XML to a suite of SchlumbergerSema custom applications called Info Diffusion, which displays results, athlete biographies, news, weather and travel information.

The OVR systems also feed data to a custom application called Commentator Information System, which provides real-time results to TV and radio commentators, such as split times during racing events.

SchlumbergerSema has completed two successful rounds of stress testing. Part of the system will go live for media on Jan. 25. Event trials begin Feb. 7 with opening ceremonies beginning Feb. 8.

"It is fair to say that the use of XML has played a critical role in the success of our overall integration project," Durrant says. ■

Yellowbrix

continued from page 25

describe what it does to populate Web portals with relevant information.

"When companies buy portal software, it's an empty portal," says Jace Wieser, CTO of YellowBrix. "We help them get existing Web information into the portal…as well as corporate data that can reside anywhere."

YellowBrix is targeting corporate intranets, having lined up such customers as Lincoln Life, Lehman Brothers and ABN Amro. But the majority of its customers are commercial Web sites run by publishers such as AOL Time Warner and CNN.

One media company that recently purchased ArchiText and iSyndicate as a hosted service is Hanley-Wood, which publishes 40 magazines and 10 Web sites for the construction industry.

Mitch Rouda, president of Hanley-Wood's Internet division called ebuild, says the YellowBrix service helped improve the company's Web content management and its news delivery.

"We have separate editorial teams for most of our titles, but there's content on one title that might be interesting to readers of another title," Rouda says. "We had this goal of getting all our content into one bucket and having an extraction method so all of our editors could use it. We also needed daily content on our site."

YellowBrix puts Hanley-Wood's content into one system so it can be shared across all Web sites. Hanley-Wood also has access to information from 2,600 other news sources. The service automatically selects and summarizes construction-oriented news stories so Hanley-Wood's editors don't have to scan the news wires.

Hanley-Wood spent three months getting the YellowBrix service ready for its flagship publication, *Builder Magazine*, which went live in September.

While YellowBrix's service is ideal for editorial applications such as Hanley-Wood's, the software faces competition in the portal market, says Laura Ramos, a research director with Giga Information Group. Many small companies such as Autonomy and Stratify offer automatic text-classification tools for portals, while Factiva, NewsEdge and Screaming Media offer syndicated Web content.

PROFILE: YELLOWBRIX

Location: Alexandria, Va.

Founded: Oct. 1997

Products: Artificial intelligence-based software that summarizes and classifies internal information for display over the Web, and software for categorizing syndicated Web content from external sources.

CEO: S. Randy Lampert

Financing: A spinoff of InfoSeek, YellowBrix has raised $45 million in two rounds of venture capital funding. Investors include SBN Amro, AOL, Bertelsmann, Disney and Soros.

Employees: 85

Customers: Include Lincoln Life, Lehman Brothers and Hanley-Wood.

Ramos says YellowBrix's technology for categorizing editorial content is good, but "how will they deal with things that are not HTML documents? How will they deal with repositories, e-mail systems and documentation systems? That's where it starts to get complex." ■

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Tutorial HC: Introduction to Data for the Voice Professional, Ed Mier, Miercom

Tutorial HJ: VPNs: Ready for Production Networks? Joel Snyder, Opus One

Tutorial HN: Linux vs. Windows: What's next in 2002? Tom Henderson, Extreme Labs

Tuesday, January 29

Session 33: Five Tips: Speeding up your Network with Web Acceleration Devices
Thomas Powell, PINT — **4:00-5:00 pm**

Session 14: Voice over IP: Enhancements We Can Expect in 2002
Ed Mier, Miercom — **10:30-11:30 am**

Session 24: Building a Robust, Scalable Storage Infrastructure in 2002
Rob Smithers, Miercom — **1:00-2:00 pm**

Session 34: Best Bet: Are Wireless LANs a Good Move for Your Network? Joel Snyder, Opus One — **4:00-5:00 pm**

Wednesday, January 30

Session 44: Optical Networking: Is it Ready for the Enterprise? Jeffrey Fritz, West Virginia University, — **10:30-11:30 am**

Session 58: The Comeback Kids: How Content Delivery Systems are Being Redrawn
Thomas Powell, PINT — **1:00-2:00 pm**

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Special Focus

APPLICATION SERVERS A raft of challenges face users integrating applications servers.

The trouble with application servers

App servers are designed to help eliminate complexity, but in some cases seem to cause it.

BY KATHLEEN OHLSON

Vendors in the crowded application server market are jamming new features into their products to support everything from personalization to mobile devices to Web services. The problem for many customers, though, is that they're still having trouble getting their basic application servers up and running.

Customers are looking for vendors to simplify the deployment and configuration of application servers, and to make it easier to sync up application servers with database management systems and other legacy applications.

"Application servers are legendary about how complex they are," says Dan Cripe, vice president of application development at Z-Tel Technologies, a Tampa, Fla., telephone service provider that's building a community voice portal atop Hewlett-Packard's Netaction application server.

> **"Application servers are legendary about how complex they are."**
>
> **Dan Cripe**
> Vice president, application development, Z-Tel Technologies

Eliminate complexity

Application servers are supposed to eliminate complexity. They typically sit between Web servers and back-end application and database servers, serving the dual role of supporting their own applications — typically consisting of JavaBeans — and providing access to other applications. Services such as security and management are also built in to the software.

One of the most frustrating things about application servers is that they can work well in a test bed, but run into problems in a heterogeneous production environment.

"What's scary is deploying applications and fracturing existing ones," says Dan Kulakowski, application development manager at Honeywell Aerospace Division in Phoenix, which is using IBM's WebSphere application server running on Windows NT to support a new tool design system.

Kulakowski has seen projects that should take a few hours take more than a month because of problems, such as unclear error messages and the inability of NT to handle the size of the WebSphere application server deployment file.

His team deciphered the latest deployment problems with WebSphere by determining the command line to deploy the tool onto the server was so long that NT didn't process it. What he'd like to see from IBM and other vendors is better documentation in application servers to say what's causing a problem and what's broken, and how problems could be fixed.

Customers also find it tricky to balance application loads and support complex applications.

"It would be nice if we had better tools to help make our decision on how to configure our environment to support multiple applications," says Angie Bensinger, vice president of centralized distributed systems at KeyCorp, a Cleveland financial services company that recently shifted from Sun's NetDynamics applications server to WebSphere.

Z-Tel's Cripe concurs, saying he's run into similar problems trying to configure and deploy multiple instances of application servers by relying on consultants or writing its own tools to customize setup. Other users would like to see improvements in programming tools.

"I'd like application servers, first and foremost, to be highly scalable. There also needs to be better integration with programming tools," says Yen-Ping Shun, vice president of Internet and client/server product development at Automated Data Processing (ADP) in Roseland, N.J. ADP, an IBM shop, uses WebSphere 3.5.

Businesses now manually deploy development code throughout large-scale environments, adding the code to each machine making the process time-consuming, Shun says.

Integrating multiple applications is also hindering Mike Plonski, CTO at Tribune Interactive, a subsidiary of the Tribune news company.

"We're spending more time than we should be integrating [our application server] with other applications in order to communicate with our Oracle 8i database," Plonski says. Tribune Interactive operates 30 news and information sites in cities including Chicago, Los Angeles, New York, Boston, Philadelphia and Washington, D.C., and recently launched its proprietary publishing system, Oxygen, on BEA Systems' WebLogic 3.5 application server.

Mike Plonski, Tribune Interactive's CTO, says his company spends more time than it should integrating application server programs.

Integration issues

While Oxygen has worked flawlessly, Tribune Interactive's IT staff is struggling with caching information from WebLogic and BEA partner WebGain's Toplink package that maps objects to Oracle 8i database serving rich media onto Tribune's Web sites. BEA adds APIs to let its partners' software work with its WebLogic application server, but Plonski says his staff has added even more coding to make the third-party software and WebLogic communicate.

Even with the additional coding between WebLogic and Toplink, caching requests to the database aren't efficient because of a lack of integration, slowing down the system, Plonski says. He says he'd like to see BEA enhance APIs to enable tighter integration with their partners.

The vendor view

Vendors try to help by offering a slew of graphical and Web-based deployment and configuration tools, but customers want to have tools that are easier to learn and use. Vendors concede application servers and tools need to be simplified, and they continue to work to provide better integration between, say, Java 2 Extended Edition programs and existing applications.

Application server makers also acknowledge that load balancing and running multiple applications can be tricky, and have responded with offerings such as iPlanet's tuning and sizing tools, and HP's software for letting Web servers spread requests across multiple instances of application servers.

IBM has attempted to make secure application access simpler by building user authentication code into WebSphere that eliminates the need for customers to build such code into each new or old applications.

In an effort to address some shortcomings, vendors are expected to bolster their integration efforts this year. IBM will release software geared toward vertical industries such as telecommunications and financial services through its recent acquisition of CrossWorlds Software.

BEA offers integration software for WebLogic through partnerships with the likes of Cap Gemini Ernst & Young, Andersen Consulting, Accenture and KPMG Consulting. It expects to continue announcing new partnerships this year, recently announcing a deal with computer services provider Deloitte Consulting. ■

Rally cry

Top features customers interviewed by *Network World* want to see implemented in application servers in 2002.

1. Integration brokers

Why: To provide tighter connections to databases, applications and other components to improve reliability and scalability.

2. Web services

Why: To develop and connect applications on the fly and connect with business partners' applications.

3. Wireless

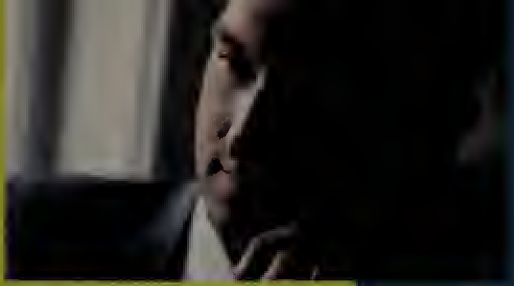
Why: To create Web-based software and services for mobile devices, such as PCs and cell phones.

4. Portals

Why: To provide content aggregation, personalization and future Web services.

5. Personalization

Why: To cater information on their Web site to specific customers.



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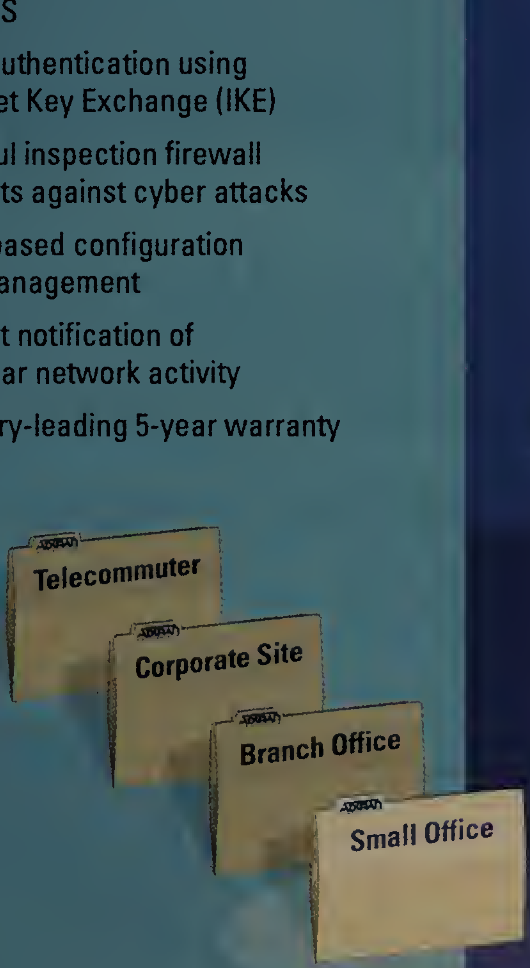

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Conxion rolls out pay-as-you-go caching

■ BY JENNIFER MEARS

SANTA CLARA — Managed Web hoster Conxion last week rolled out a suite of content delivery offerings, including a caching service that will let companies accelerate specific content rather than entire Web sites, and pay for the service per use.

Conxion is placing CacheFlow caches in its data centers to provide the Cache-on-Demand service it says provides a simpler, more cost-effective alternative to larger content delivery networks (CDN). To use the services, companies determine what content they want cached and then change the DNS address to point to Conxion's network, says Phil Simmonds, a marketing executive at Conxion.

Content is uploaded to the Conxion caches, and when an end user requests content, it is delivered from the cache in the closest Conxion data center rather than from the origin server. The cache redirects requests for uncached content to the origin server.

There is no need to change application code or alter origin servers, and the service can be up and running in minutes, Simmonds says. The service is about $2 per gigabyte on average, but can go lower, he says.

H2F Media, a provider of media marketing services, has been using a beta version of Cache-on-Demand for more than a month. H2F uses a dedicated server environment and Conxion's HotRoute technology to accelerate the delivery of its rich-media e-mail marketing campaigns.

H2F was looking for a way to move the content closer to end users, says Jim Van Kerkhove, H2F's president. Conxion's HotRoute technology replicates data in servers distributed across Conxion's network and determines the best path to deliver content to end users, but keeps content at the core.

Cache-on-Demand is Conxion's first foray into delivering content from the edge of its network, similar to what CDNs do with their caching servers that sit at the edge of networks.

H2F used Cache-on-Demand to deliver a targeted e-mail campaign that included an 8-minute video clip to 250,000 users. Van Kerkhove was impressed with the simplicity of the service's installation.

Van Kerkhove would like to see better monitoring tools with the service, such as access to media logs for tracking and reporting. A Conxion spokesman says the company plans to fulfill that wish.

Other enterprise services Conxion announced are:

- Conxion FTL (Faster Than Light), which uses the HotRoute technology to accelerate content from shared or dedicated servers in Conxion data centers.
- EDU Conxion, which is designed for universities and colleges whose users typically pull a lot of content from the Internet. Schools connect to the Conxion network through a dedicated line. ■

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Short Takes

■ Wireless ISP **GoAmerica** recently announced it's offering access to **mySAP Mobile Business Applications.** The service lets SAP users easily access the same applications on their desktop via their wireless device. GoAmerica has teamed with SAP to offer direct access to e-mail, corporate applications and the Internet. Customers can access GoAmerica's network using a Palm, Research In Motion, Pocket PC, or Windows CE wireless device or a laptop. The service costs about $60 per month, per user. www.goamerica.net

■ **The Commercial Internet eXchange** is no more. The nonprofit group, which represented the interests of ISPs, last week announced it was disbanding. Some members announced the formation of a new group called the U.S. ISP Association, which will focus on Internet security, online liability and compliance with the antiterrorism law, the USA-Patriot Act and the Council of Europe Convention on Cybercrime. The group's initial members include AOL, Cable & Wireless, EarthLink, eBay, Teleglobe, Verizon and WorldCom.

Looking Glass focuses on MAN services

New provider targeting large companies and carriers in nine U.S. markets.

■ BY MICHAEL MARTIN

OAK BROOK, ILL. — Looking Glass Networks, a metropolitan-area network provider offering SONET, wavelength, Ethernet and dark-fiber services to other service providers and large companies, officially launched its services last week.

While there are several other providers offering MAN services, CFO Sunit Patel says his company has an advantage because it installs and owns the fiber used in its networks.

Looking Glass offers services in nine markets: Seattle; San Francisco; Los Angeles; Chicago; Dallas; Houston; Atlanta; Washington, D.C./northern Virginia; and New York/New Jersey.

Looking Glass says it hopes to have about 100 buildings connected to its network by the end of March. Most of those buildings will be carrier hotels and collocation facilities. Looking Glass plans to build out fiber to enterprise buildings if there is enough demand in a particular building.

Much has been written about U.S. carriers having more fiber capacity than they can fill. While that may be true in long-haul networks, it's not true in the MAN, Patel says. He cited a JP Morgan study, which showed that while long-haul bandwidth has increased 384 times what it was five years ago, MAN bandwidth has grown only 16 times in the same time period.

"It's harder to build in the metro, because of the short route distances; many connections; [Federal Communications Commission], state, county and city approvals; and negotiating rights of way," he says.

On the carrier customer side, Patel expects most demand to be for SONET services. Wavelength services will be a popular enterprise option, with demand for Ethernet growing, he says.

Currently, there is a lot of enterprise demand for dark fiber, Patel says.

"Many companies, like large financial institutions, are so paranoid about security that they'd rather just build their own network," he says.

Focal Communications, a national service provider catering to large companies, has used private line services from Looking Glass in several markets for about six months.

While Focal uses a variety of competitive providers to reach its customers, Looking Glass offered routes other providers didn't have, says Jon Barnicle, Focal's president.

"We also like them, because they offer some options other carriers don't, such as the dark fiber," he adds.

For lit services, the minimum purchase a customer can make from Looking Glass is a DS-3, which would cost about $1,000 per month, Patel says. Most customers sign for much larger deals, he says.

Dark-fiber services would run into the tens of thousands of dollars for a 20-year contract.

Looking Glass: www.lglass.net

PROFILE: LOOKING GLASS NETWORKS

Location: Oak Brook, Ill.

Founded: April 2000

Product: Facilities-based metropolitan-area bandwidth and dark fiber.

Management: Lynn Reefer, CEO; Sunit Patel, CFO; Stacy Jenkins, senior vice president of network deployment.

Financing: $200 million in equity financing, led by Madison Dearborn Partners and Battery Ventures; $275 million in senior secured credit from a variety of sources.

Employees: 198

Customers: Carriers and large companies.

Fun fact: The company is named after Lewis Carroll's book *Through the Looking Glass* and the limitless possibilities represented in the book.

EYE ON THE CARRIERS

Johna Till Johnson

Looking back on a few tech trends that weren't

A regular New Year's ritual for me is to go through old files and archives, reviewing past issues and (one hopes) learning something from those experiences. This year I looked back over 10 years of carrier service technology developments, with an eye toward evaluating why certain promising technologies failed to arrive.

Here are a few of the tech trends that didn't pan out ... and the reasons why:

- **Switched Multimegabit Data Service (SMDS).** Anybody remember that? You may if you worked at Bellcore, which created it, or MCI, one of the few major service providers that deployed it. Developed roughly at the same time as ATM — and partially with the hope of circumventing ATM's Byzantine standards process — SMDS was envisioned as a high-speed, data-only public service that incorporated quality of service (QoS).

It wasn't a bad idea. There was a clear business need for this type of service, as witnessed by the contemporaneous success of frame relay. Why did frame make it while SMDS tanked? A huge part of the credit goes to the Frame Relay Forum, which did two things right: 1) created a concise, easy-to-understand, easy-to-implement standard, even at the expense of desirable features, such as QoS, which was added later; and, 2) gained a critical mass of vendor support early.

- **Ubiquitous ISDN.** Granted, ISDN has had a second life as a back-up strategy for corporate frame networks, and a few hardy souls still use it for Internet access. But it failed to live up to its early-'90s hype as a one-size-fits-all converged infrastructure. What went wrong?

First was the lack of a "killer app" requiring voice and data connectivity across the same wire. Companies that needed to converge voice and data for cost reasons were perfectly happy with time-division multiplexing muxes, and for the rest of us, plain old telephone service was fine. Second, ISDN didn't offer enough bandwidth improvement over existing switched data services, particularly as 24K bit/sec and faster modems emerged. Finally, the painful deployment process alienated potential customers and gave the Bell companies a lasting black eye. Bottom line: Make sure you're solving a real user problem — and don't forget that the devil's in the execution.

- **IPv6.** No look back would be complete without revisiting IPv6. Admittedly, the requirements of mobile data networks may yet drive the deployment of IPv6 services, so reports of its demise may be somewhat exaggerated. But IPv6 was supposed to be up and running long before now (the original goal was to supplant IPv4 entirely by 2001). What happened? Basically, IPv6 failed to offer a substantial enough improvement over IPv4. And, as with ISDN, not enough time and energy went into effecting a smooth deployment.

Not everyone missed this last point. "Deploying IPv6 is going to be an incredibly painful process, and it may not even succeed," said Dave Piscitello, former Internet Engineering Steering Group member — back in 1994. Nice call, Dave.

Johnson is senior vice president and CTO for Greenwich Technology Partners, a network consulting and engineering firm. She can be reached at johna@greenwichtech.com.

Congress, regulators face plate full of issues

■ BY GEORGE CHIDI JR.

Bogged down by matters of domestic security and economic stimulation, Congress quit the year 2001 without making a number of important telecommunications votes. Look for this unfinished business to resurface soon in one form or another.

The agreed settlement between NextWave Telecom, the Federal Communications Commission and several wireless carriers expired Dec. 31 because Congress has not — and may not — change the law in the manner stipulated in the agreement. Meanwhile, the so-called Tauzin-Dingell bill — proposed legislation that would let the regional Bell Operating Companies into long-distance data services — is still gathering dust.

Nextwave case rolls on

The FCC revoked NextWave's spectrum licenses for wireless services when the company defaulted on payments and filed for bankruptcy in June 1998. NextWave regained the licenses in court under bankruptcy law, but not before the FCC had reauctioned them to other carriers for about $17 billion.

NextWave then cut a deal with the carriers and the FCC, and was ready to turn over the licenses to the carriers for $6 billion, with the carriers paying the FCC $10 billion. The settlement essentially required Congress to indemnify everyone involved from future lawsuits and to set up expedited judicial review procedures. But Congress had to pass the legislation by Dec. 31 or the deal was off.

Legislators cried foul, saying they couldn't or shouldn't vote to reward NextWave for strategic bankruptcy without at least having hearings and mulling it over.

NextWave indicated that it would move forward with plans to build its own wireless network using the licensed spectrum.

REGULATORY ROUNDUP

Tauzin-Dingell bill lingers

While the NextWave settlement is effectively tabled, the Tauzin-Dingell bill is still on a table, somewhere, under a layer of dust and chlorine-dioxide gas with the rest of the unopened mail in Washington offices. Although a December vote was anticipated, Congress pushed Tauzin-Dingell, otherwise known as Internet Freedom and Broadband Deployment Act of 2001, to March . . . maybe. The bill floated through Congress for most of 2001 without any resolution.

If enacted, the bill would open up long-distance data services to RBOCs without requiring substantial local phone service competition.

The FCC may do on its own what the Tauzin-Dingell bill has not. The commission initiated the first triennial review of unbundled network element rules in December and will examine regulations governing incumbent carriers' broadband services. The FCC started a market review of broadband services last August, and, in its notice for proposed rulemaking in the triennial review, asked whether unbundled network access for local switching should be phased out over time.

Together, these moves might signal a change in the rules under authority derived from Section 706 of the Telecommunications Act of 1996. FCC Chairman Michael Powell says he has an open mind about how the review will come out, while Commissioner Michael Copps says the commission should use the proceedings to understand the marketplace better in a role as policy implementers and not policy makers.

While the executive and legislative branches are taking a crack at telecommunications competition, the U.S. Supreme Court will have its say as well. The court is expected to hand down a ruling on several telecom cases in the coming weeks. Ten cases were combined into three hearings before the Supreme Court.

The Tauzin-Dingell bill is still on a table, somewhere, under a layer of dust and chlorine-dioxide gas with the rest of the unopened mail in Washington offices.

At issue are the Telecom Act of 1996 and state sovereignty; whether or not broadband Internet over cable lines is a telecom service subject to phone regulations or remains a largely deregulated cable service; and Total Element Long Run Incremental Cost, the accounting procedures the FCC uses to determine how much competitive phone carriers must pay to access incumbent network elements.

In other developments:

- The FCC may use 2000 federal census data to revise its definitions of rural areas and high service cost areas for telecommunications carriers, potentially changing the mechanism for assessing universal service support fees.
- The Network Reliability and Interoperability Council met Jan. 4 at FCC headquarters in Washington. Powell told industry experts and representatives to be upfront with customers about shortcomings of new products and services, or face regulation.
- The FCC missed a self-imposed Dec. 31 deadline to give carriers technical standards so service providers could comply with the Communications Assistance for Law Enforcement Act (CALEA) of 1994. CALEA requires carriers to give law enforcement the same ability to tap a digital phone line as a circuit-switched loop.
- BellSouth withdrew its application to provide long-distance service in Georgia and Louisiana in December, citing in its notice of withdrawal the FCC's request that Bell South provide additional information on its electronic service order processes, and the collaborative process for implementing software changes to the support systems used by competitors. Verizon also applied for long-distance service approval in New Jersey.

Chidi is a correspondent with IDG News Service's Boston bureau. Cara Garretson, a correspondent in the Washington, D.C., bureau, contributed to this story.

The Edge

■ SERVICE PROVIDER DEVELOPMENTS AT THE JUNCTURE BETWEEN THE ENTERPRISE AND THE NEW PUBLIC NETWORK

Short Takes

■ **Tellabs** last week completed its acquisition of metropolitan distributed cross-connect start-up **Ocular Networks.** Tellabs announced plans to acquire the company late last year for $355 million. The deal lets Tellabs address the metropolitan and Tier 2/3 carrier markets with three digital cross-connect products that now comprise the Tellabs 6400 line. Products within the line perform add/drop multiplexing, wide-band and broadband digital cross-connect functions, and data switching. Ocular will now be the **Tellabs Metro Networking Group.** www.tellabs.com

■ **Integral Access** has named a former AT&T and Lucent executive vice president of sales. Richard Moscioni assumes responsibility for the Integral Access North American sales organization, including internal and field sales teams. He reports directly to CEO Jack Cicon.

Moscioni has more than 25 years of telecommunications industry experience. Previously, he was vice president of global sales for Southampton Photonics, a start-up developer of optical components and subsystems. www.integralaccess.com

■ **Corrigent Systems** last week emerged from stealth mode with its **CM-100** series of metropolitan transport gear. The company is introducing a Resilient Packet Ring-enabled box that attempts to provide SONET resiliency for packet-based traffic. The company says its offering is unique because it supports a full set of SONET/SDH and Ethernet services over RPR, speeds as high as 10G bit/sec, and is half the cost of optical Ethernet or next-generation SONET platforms. The CM-100 is in beta tests. Corrigent officials did not disclose expected shipment dates. The product is expected to compete against RPR switches from Lantern Communications and Dynarc, among others. www.corrigent.com

Switch maker unveils hybrid

TeraBurst says box combines benefits of electrical and optical switching.

■ BY TERRI GIMPELSON

SUNNYVALE, CALIF. — TeraBurst Networks has unveiled what it claims is the industry's first "transparent" electrical switching fabric that combines the advantages of all-optical switching with electrical functions.

The 2-year-old California company says its optical-millimeter wave-optical (OMO) switch fabric incorporates the performance monitoring, retiming, reshaping and retransmission capabilities associated with optical-electrical-optical (OEO). But it also features the density, and bit rate and protocol independence of all-optical switching, TeraBurst says.

PROFILE: TERABURST

Location:	Sunnyvale, Calif.
Founded:	January 2000
Product:	Optical-millimeter wave-optical (OMO) switch in 20- or 64-port configurations.
Management:	Ashok Jain, chairman and CEO; Tom Myers, COO; Raja Venkatesh, CFO
Investors:	Raised more than $51 million from Crest Communications Holdings LLC, Labrador Ventures, Merrill Lynch Ventures LLC and others.
Employees:	80
Fun fact:	TeraBurst offers its employees a nutritional program to help promote a healthy lifestyle.

TeraBurst's fabric converts an incoming optical signal into an electrical signal, enabling performance-monitoring capabilities. The electrical signal is then conditioned into an analog signal before being switched.

The switch fabric consists of several passive devices. Among these is a redirection mechanism that TeraBurst likens to floodgates.

Once a path of transmission is determined via an in-house, patented algorithm, the redirection gear sends the signal along like floodgates would send water along when opened. The algorithm sets up primary light paths and restoration paths for wavelength routing. This process then is reversed, and an optical signal emerges again.

TeraBurst's OMO fabric can be found in two of the company's switches, the Optical Management System (OMS) 2100 and 2200. The 2100 is a 200G bit/sec, 20x20-port switch that can scale up to 800G bit/sec and is equipped with up to 40 gigabit interfaces. It fits into one-third of a rack.

The 2200 is a 640G bit/sec, 64x64-port box that is scalable to 2.56 terabit/sec. It is also capable of supporting 40 gigabit interfaces in one-half of a rack.

Both boxes perform wavelength conversion and performance monitoring functions, as well as the retiming, reshaping and regeneration capabilities.

Applications for the 2200 include wavelength switching and traffic management between a metropolitan ring and core long-haul network. The 2100 can be used to interconnect high-bandwidth locations, such as corporations running bandwidth-hungry applications.

Hybrid approaches

Several other vendors are attempting to develop fabrics that integrate and replicate the benefits of electrical and optical switching. However, these other hybrid approaches do not represent true integration, but merely interoperability, says Shantanu Mitra, TeraBurst director of marketing.

Mitra says these hybrid approaches do little to eliminate the negative aspects associated with OEO fabrics, such as limited density and limited bandwidth, or the lack of performance monitoring with all-optical switching.

Despite TeraBurst's self-proclaimed innovation, industry analysts are concerned with the company's lack of customers. While TeraBurst says that a competitive local exchange carrier (CLEC) has the company's switches deployed in field trials, no formal announcements have been made.

Michael Howard, co-founder and principal analyst for Infonetics Research, says that while TeraBurst's technology looks promising, the real proof-of-concept is purchase by service providers.

"It's hard to know what these service providers are thinking without some real announcements," Howard says. "But since most of them don't want to tip their hand to competitors, there's a real double-edged sword here."

A recent report from Current Analysis echoes Howard's concern.

"Reference accounts at every step of the way are crucial in proving TeraBurst's OMO technology," the report says.

TeraBurst maintains that it is finalizing a deal with the CLEC and expects to make a formal announcement by the middle of February.

The Current Analysis report also lists several other competitive concerns, one of which is the scalability of the 64x64 2200 box.

"This is not very competitive for a nongrooming switch," the report says. "If a carrier is not running OC-192 or above into every port, this scalability is not competitive."

TeraBurst says it is developing a bigger box. Mitra alluded to the size of that box being 256x256 ports, but would not divulge any other details. He says TeraBurst is expecting to make a midyear announcement.

TeraBurst has also partnered with Atoga Systems, which has an aggregation box — the OAR 30 — that grooms down to the STS-1 level.

But Infonetic's Howard says Atoga has also not yet sold any products.

"Successful companies are the ones that the carriers are buying from," he says.

Still, analysts note the operational cost savings potential of TeraBurst's products. Current Analysis points out that the OMS 2200 takes up only a half rack, compared with competing products from Tellium, which fill a full rack or more. Power consumption is also low, adding to long-term cost savings for carriers.

Both TeraBurst switches are available. No pricing information was released.

TeraBurst: www.teraburst.com

More online!

Our Tester's Choice featured columnist says that all-optical is a myth.

DocFinder: 7730

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Technology Update

AN INSIDE LOOK AT THE TECHNOLOGIES AND STANDARDS SHAPING YOUR NETWORK

Ring Spanning Tree brings resiliency

BY TIM WU

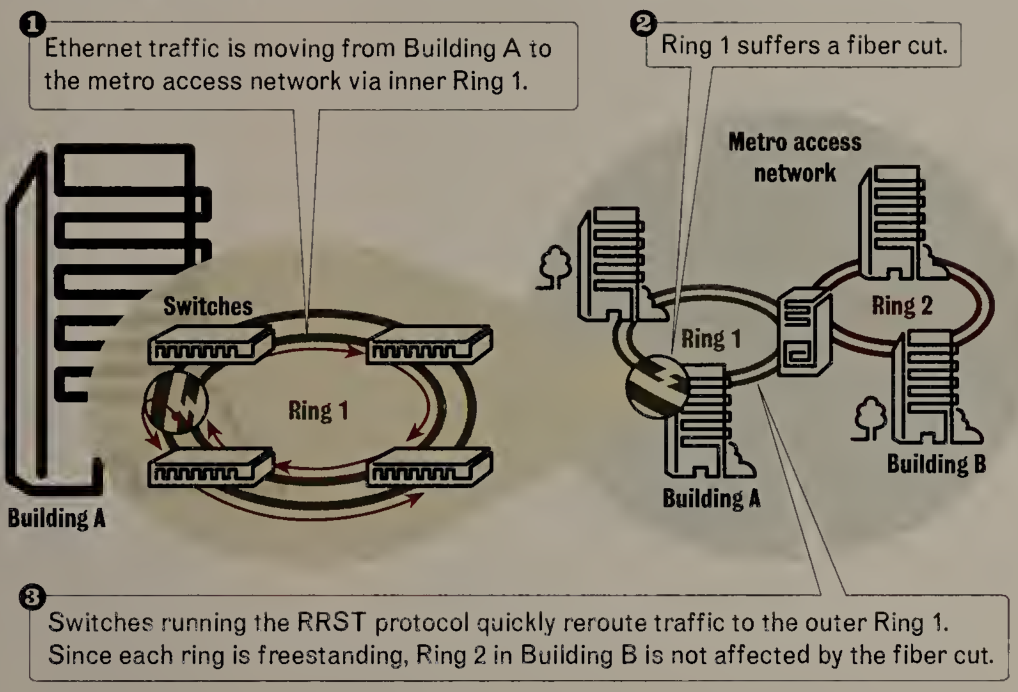
Carriers everywhere are deploying Ethernet in their metropolitan-area networks, and the fiber they use is being deployed in ring configurations. This has given birth to a demand for Ethernet resiliency that is designed for rings. And that is available now.

A simple and increasingly popular solution for rings is Rapid Ring Spanning Tree (RRST). An important enhancement to Spanning Tree Protocol, RRST is popular because it represents an Ethernet-802.3-compatible protection system, optimized for ring topologies.

RRST has gained attention as carriers in the U.S., Europe and Asia have deployed it through their metropolitan Ethernet networks.

Rapid Ring Spanning Tree

RRST brings SONET-like self-healing features to Ethernet-based metropolitan access network rings.



① Ethernet traffic is moving from Building A to the metro access network via inner Ring 1.

② Ring 1 suffers a fiber cut.

③ Switches running the RRST protocol quickly reroute traffic to the outer Ring 1. Since each ring is freestanding, Ring 2 in Building B is not affected by the fiber cut.

Not to be confused with RPR

RRST isn't the same as Resilient Packet Ring (RPR) protocol, although it shares many of the same goals.

RPR represents an effort to design a new Layer 2 protocol for highly resilient data transport.

RRST, on the other hand, works with "classic" 802.3 Ethernet — the strain found in enterprise and metropolitan networks. This means it can be implemented directly in most metropolitan Ethernet networks.

It is expected that RRST and RPR will be deployed in different parts of service providers' networks. Early versions of RPR are primarily deployed as regional transport solutions — that is, to connect carrier points of presence across an entire metropolitan area.

RPR has better resiliency than RRST, justifying its higher cost.

Meanwhile, RRST is better suited to being rooled out in access networks — networks that reach customer sites only within a city. In access networks, simplicity and low cost are the overriding concerns.

RRST takes advantage of several enhancements to the traditional Spanning Tree Protocol, known as 802.1D. It utilizes the recently standardized Rapid Reconfiguration Protocol, known as 802.1w, to make rapid decisions to change a port state from blocking to forwarding, and vice versa.

In addition, RRST works in a strict ring and therefore makes decisions for changing ports very quickly. The result is very predictable and fast (less than 500 msec) recovery times in most failure modes.

The protocol creates a separate resiliency instance for each ring in a service provider's network. This divides a larger problem (network resiliency) into multiple, smaller problems (ring resiliency).

Within each ring, RRST uses Spanning Tree's standard Bridge Protocol Data Units to establish a root bridge. Unlike random topologies with Spanning Tree, in which the root bridge almost never blocks traffic, in RRST the root is doing the blocking.

Because all RRST nodes are in a ring configuration, there is no need for complicated topology discovery and long waiting periods after a failure. The root bridge can immediately change the state of a previously blocking port, to forwarding.

Added value

It is also a useful tool for scaling Layer 2 networks. When service providers can deal with Ethernet resiliency one ring at a time, they can more easily build out large, multiple-ring networks while retaining the same predictable failover functionality.

Finally, ring spanning trees, while timely, are not the only important enhancement to spanning trees. Besides the well-known rapid spanning trees, per-virtual LAN multiple-VLAN spanning trees can be very useful for certain network architectures.

Wu is technical marketing director at Riverstone Networks. He can be reached at twu@rstn.net.

Got great ideas?

Network World is looking for great ideas for future Tech Updates. If you have one and want to contribute it to a future issue, contact Features Editor Neal Weinberg (nweinberg@nww.com).

Ask Dr. Internet

By Steve Blass

How can my company get an IP address space without going through an ISP? We want to achieve some independence and be able to change ISPs if they aren't meeting our expectations. But we don't want to go through the hassle of readdressing our hosts every time we switch ISPs and have to return the addresses.

The American Registry of Internet Numbers (ARIN) handles IP address administration for North and South America. Follow the registration services link at www.arin.net to find the instructions for requesting IP addresses from ARIN. Note the repeated warnings: "Provider-independent [portable] addresses obtained directly from ARIN are the least likely to be globally routable." Fill out the Enduser IP Request Template at www.arin.net/regserv/ip-assignment.html, and send it to hostmaster@arin.net to submit your IP address request. Be prepared to document your network utilization, topology and routing plans as specified in the instructions and RFC 2050 (www.faqs.org/rfcs/rfc2050.html). If your request is approved, you will have 60 days to submit the billing form, establish your account and pay for the first year.

Blass is a network architect at Change@Work in Houston. He can be reached at dr.internet@changeatwork.com.

In the office: Monday.
In the hotel room:
Tuesday–Friday.
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Microsoft

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True to type

OK, we admit, we are font junkies. And can you blame us ... for what can thrill the heart and soul more than the thrilling curve of a well-turned serif or the visual syncopation of an elegant drop cap? That's why we have about 1,000 fonts installed.

But fonts can be a big pain in the butt — particularly when you've got a gazillion people on your network — as font problems can be hard to diagnose and often look like other problems.

So, how do fonts become problematic? First, there's the issue of having too many fonts installed.

According to Microsoft (www.nwfusion.com, DocFinder: 7737) the limitations are: "You can install a maximum of approximately 1,000 TrueType fonts in Microsoft Windows 95, Windows 98 and Windows Millennium. The exact number of TrueType fonts you can install varies, and depends on the length of the TrueType font names and file names. . . . Installed TrueType fonts are listed in the registry and in the Graphics Device Interface (GDI). . . . All font files are registered under a single key in the registry, and a registry key cannot exceed 64 KB in Windows 95. If font names average 20 characters in length and font file names average 10 characters in length, the maximum number of TrueType fonts you can install falls between 1,000 and 1,500."

But that's not all: "If a TrueType font file is located in a folder other than the Fonts or the System folder, the full path to the font is included in the registry, using up more space in the key and reducing the number of fonts you can install. . . . The GDI contains an internal list of fonts, with 10 KB reserved for font file names. If font file names average 10 characters in length, the maximum number of TrueType fonts you can install is approximately 1,000."

A side effect of having many fonts installed is that the system can slow down because parsing the font names in the key takes a long time.

But does anyone know what the maximum number of fonts is for Windows NT, 2000 and XP? We have searched high and low and we can't find out!

So it turns out that with Windows 95, 98 and ME, if the registry key is too long, you can expect trouble. And of course, if the key is corrupt, you can also expect trouble. And if fonts are missing, you can expect more trouble. And if fonts themselves are corrupt, you can expect even more trouble. Thus, keeping everything nice and tidy is pretty important.

We have found a few useful tools for dealing with fonts. First there is Font Thing, a free utility from Sue Fisher (http://members.ozemail.com.au/~scef/tft.html) that provides very good browsing and basic font management facilities.

The Font Thing interface uses a window divided in half: a navigation panel on the left and a viewing panel on the right. The navigation panel shows you the installed fonts and collections of fonts, or you can browse to other directories to check out uninstalled fonts.

The viewing panel shows a text sample rendered in one or more of the selected fonts, the character set for a single font or detailed font properties. There's even a place for you to make notes about each font. Even though Font Thing is dated 1999, it works fine with XP — for free this is a terrific tool.

Our second tool is FontAgent from Insider Software (www.insidersoftware.com). FontAgent is focused more on the management issues of fonts, and it can find and correct font problems in your system.

FontAgent can scan your disks for fonts, verify their integrity, eliminate duplicate fonts (something that happens very easily if you are a font junkie), fix unmatched fonts (Type 1 fonts require Printer Font Metric and Printer Font Binary files to display and print correctly — when fonts are moved the files may become separated, so FontAgent identifies unmatched, orphaned font files). It also can give font files identifiable names and optionally create libraries of fonts to make it easier to manage large collections.

Our only criticisms of FontAgent is that its display seems to be corrupted under XP (the window panels aren't colored) and the user interface is not as easy to use as it could be. That said, it is one of the most sophisticated, font management tools we've seen. FontAgent is $50 under Windows and $70 for the Macintosh.

Our third pick is Suitcase Network from Extensis Products Group (www.extensis.com/suitcasenetwork/) but we've run out of space so more next week when we find out about managing fonts for an entire network.

Your tool choices to gearhead@gibbs.com.

Cool Tools

Quick takes on high tech toys

KEITH SHAW

Lord of the Things

Home networks move to the living room

Walking through the numerous exhibits at the 2002 Consumer Electronics Show in Las Vegas, I kept thinking about all the phone calls I'm going to get from family, friends and neighbors asking me to help hook up their home networks.

If you've ever gotten one of these requests because of your network knowledge, get ready for a slew of new phone calls. Not only will your friends want you to network their computers, they're also going to ask you to network their TVs, stereos and refrigerators.

One recurring theme from the show is that everything in the home will soon be networked. According to many vendors, the digital center of the consumer universe will soon be moving from the office, where the PC sits, into the living room, where the home entertainment system sits.

Witness the new set-top box from Moxi (www.moxi.com). The Moxi Media Center (get ready for the acronym MC) is a combination of a digital set-top box, video and music jukebox, personal video recorder (like TiVo and ReplayTV), and an Internet gateway and firewall that hooks up to a broadband connection. The content that comes in (via satellite or cable) will then be able to be streamed (via wires or wireless) to other Moxi devices connected to TVs or to other PCs in the house. The Media Center also has a CD/DVD player that can store the music digitally on its 80G-byte hard drive (it can also store video content). Don't rush out to buy it just yet, as Moxi is only selling the Media Center to satellite providers and cable system operators, who will then likely let you lease or buy the box.

In this new world of the connected living room, the home PC becomes a peripheral that connects to the living room's media center. Or you could say the Moxi acts like a server to which all your other desktop PCs (or other TVs in the house or your stereo system) connect as clients.

The Moxi is just the latest entrant in this movement — other companies also are trying to accomplish this. SonicBlue's new ReplayTV 4000 adds a broadband port for downloading content, and Vialta's ViDVD player is a DVD player that plays MP3 files and CDs; connects to the Internet; views digital photos; and plays karaoke CDs. Microsoft's Ultimate TV and TiVo's new products only crowd the field a bit more. Recordable DVD players that let you put all your home videos on a new DVD format also will get you moving away from the office and into the living room.

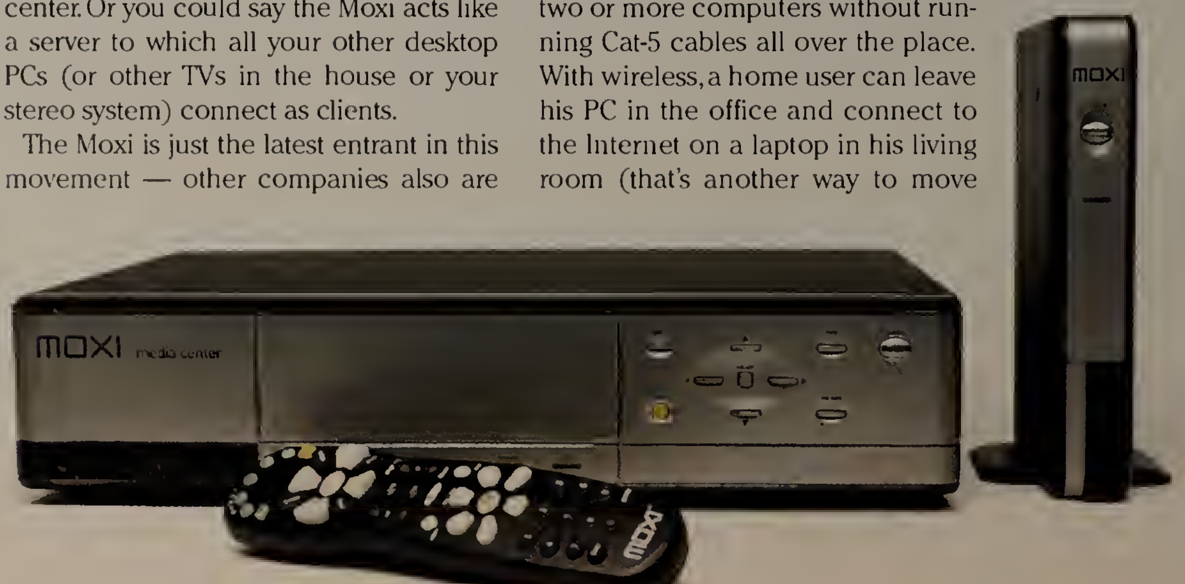
For those of us back in the PC world, there are still many vendors that want to help consumers connect all their computers. Prices on 802.11b (WiFi) networks have reached the point where more consumers are trying this option to connect two or more computers without running Cat-5 cables all over the place. With wireless, a home user can leave his PC in the office and connect to the Internet on a laptop in his living room (that's another way to move computing to the living room).

And for users who haven't tried wireless networking yet, there are vendors with power-line and phone-line networking products that are finally hitting the marketplace. And in case you wanted to move all your digital content to the kitchen, there's Icebox (www.iceboxllc.com), an "under the cabinet" box that lets you surf the Web, monitor Web cameras and listen to digital audio files from your kitchen.

Of course, vendors say creating the networked home will be very simple, but we know better. So get ready for the phone calls from your friends and family, and make sure you know the difference between an RCA cable and a composite video cable.

Note: I saw so many new products and technologies at CES that there's not enough space here to write about it all. So go to www.nwfusion.com, DocFinder 7735, to find my exclusive Web coverage of the show.

Send any Cool Tools info to kshaw@nww.com.



The Moxi Media Center aims to be the center of your home digital universe.

COMNET 2002

"MEASURE TWICE, CUT ONCE."

This common mantra saves laborers time and materials, whether they are part of a construction crew or sewing circle. ComNet 2002 attendees, too, can save resources and make the most of their trip to Washington, D.C., by plotting show days in advance rather than aimlessly wandering the exhibition halls of the Washington Convention Center. To help, we've selected some highlights from among the dozens of presentations, tutorials and seminars scheduled between Jan. 28 and Jan. 31.

An enterprise applications track has been added to the ComNet lineup, says Rob Scheschareg, vice president of sales, marketing and product development at IDG World Expo. Show organizers made an effort this year to expand ComNet to include the applications that run across enterprise networks, such as supply-chain management, customer relationship management and peer-to-peer, Scheschareg says. Also debuting at ComNet 2002 is the Wireless Solutions Pavilion, where wireless vendors will display their wares.

So if you're one of the expected 30,000 attendees, take along our guide to help plan your ComNet days . . . and enjoy the show.

MONDAY JAN. 28

Wireless in the enterprise — Your guide to wireless communications and networking

9 a.m. to 4 p.m.

Most companies are still in the cell phone/pager stage of wireless experimentation, says Craig Mathias, principal at Farpoint Group. For those thinking about taking their company's wireless investment to the next level, Mathias will cover all that is involved in an enterprise wireless deployment in this day-long tutorial. The tutorial will give a broad overview of short-range wireless; metropolitan-area networks (MAN), including the wireless local loop; wide-area systems; communications satellites; location-based services; and standards, including Bluetooth, 802.11a and 802.11b — plus the system integration effort required to pull it all together.

Linux vs. Windows 2000: What's next in 2002?

1 to 4 p.m.

Tom Henderson

The Linux vs. Windows debate pits advocates of open source and proprietary systems against each other — but could there be room for both to peacefully coexist in your organization? In this tutorial, Tom Henderson, director of ExtremeLabs and member of the Network World Global Test Alliance, will cover the pros and cons of using Linux and Windows for your servers and desktops, plus share tips for selecting the operating system that's right for your organization.

TUESDAY JAN. 29

Security and the Beltway: What you need to know about Washington's InfoSec initiatives

10:30 to 11:30 a.m.

There seems to be increased recognition on the part of policy makers that greater cooperation and coordination is needed among the public and private sectors to safeguard information security, says Evan Corcoran, counsel at Wiley Rein & Fielding and leader of this session. Corcoran and a panel of information security experts will discuss the security threats that exist, what the government is doing to combat cybercrime, and opportunities and incentives for businesses to get involved. The panelists are Michael A. Vatis, director of Institute for Security Technology Studies at Dartmouth College; Jody Westby, president of The Work-it Group; and Norman A. Willox, chief officer for privacy, industry and regulatory affairs at LexisNexis.

10-Gigabit Ethernet: Ready for production networks?

1 to 2 p.m.

There's been lots of talk about 10G Ethernet, but not much action among cautious corporations. But things are set to change, says Phil Hippensteel, senior consultant at Perfect Order. Increases in packet-based voice traffic and the trend to disperse the traditional data center are driving enterprise interest in 10G Ethernet, he says. Companies working to plan their WAN infrastructures need to be aware of issues that crop up when using Ethernet over the long haul, such as propagation delay, and their effects on applications. In this session, Hippensteel will discuss what to expect as Ethernet expands from the LAN to the MAN.

Network products in action

Test results can tell you things about a product that a data sheet can't. At the Best of the Tests Pavilion, you'll find assembled the best of the more than 240 enterprise network products tested last year by *Network World's* team of experts. Winning products from industry leaders and start-ups range from client maintenance and quality of service to multimedia and wireless networking. Spirent Communications will provide live test demonstrations. Vendors showing their award-winning products include CacheFlow, Cisco, Compaq, iConverse, Intel, NetIQ, RSA Security, Sitara Networks and SunCobalt. The pavilion, located in Booth 870, is open during exposition hours.

NetworkWorld BEST OF THE TESTS AWARD 2001

PICK OF THE DAY

Network World's VPN Showdown

2:30 to 3:45 p.m.

Washington Convention Center, Hall C

NetworkWorld SHOWDOWN VPNs

Executives from AT&T, WorldCom, Genuity and Equant will be in the hot seats at the VPN Showdown, where they will field tough, unscripted questions about their IP-VPN products and services from analysts, each other and audience members. Pricing, security, equipment, reliability, service levels — no subject is off limits. Jim Metzler, founder of the Ashton-Metzler consultancy, and John Gallant, president and editorial director of *Network World*, will preside over the presidential-style debate. Representing the vendors will be Jonathan W. Cohen, director of advanced IP network services at AT&T Business; Janel Crabtree, director of global VPN services at WorldCom; Arjen Maarleveld, head of products at Equant; and John Summers, director of product strategy at Genuity.

Five tips: Speeding up your network with Web acceleration devices

4 to 5 p.m.

Improving your corporate Web site performance doesn't have to drain your IT budget, says Thomas Powell, president of Pint and member of the Network World Global Test Alliance. In this session Powell will dissect the data delivery path from server to site visitor and suggest opportunities along the way for enhancing performance. His tips will cover a range of investment levels, from the economical — such as trimming traffic-clogging graphics — to the more committed, such as investing in caching devices.

WEDNESDAY JAN. 30

Firewalls: Securing the network from the gateway to the desktop

10:30 to 11:30 a.m.

At their most basic, firewalls restrict traffic through access control rules. But the similarities end there. Firewalls come in all shapes and levels of complexity. Some add intrusion detection, others throw in antivirus features. Some are combination firewall VPNs, others include traceroute functions for tracking the computer addresses of attackers. David Strom, president of David Strom, Inc., will run through your options in this session and share recommendations for firewall deployment.

Net and identity services: What does Microsoft have brewing for you?

1 to 2 p.m.

Even if you've avoided installing Microsoft products on your network, there's no getting around the company's influence. Microsoft fans and foes share a stake in the company's Passport service, which Microsoft bills as a universal authentication mechanism for its .Net interconnected computing environment. In this session, Dave Kearns,

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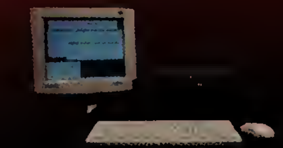

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freelance writer and author of *Network World's* Wired Windows column, will try to sort through the hype and rumors about Microsoft's product plans and licensing policies and how they will affect your corporate network and the way your company conducts business over the 'Net.

PICK OF THE DAY Town meeting: What's ahead in communications policy and regulation?

2:30 to 3:45 p.m.

Richard Wiley

Key government officials will come together to discuss the issues atop this year's communications policy and regulation agenda in this ComNet Town Meeting. Former Federal Communications Commission Chairman Richard Wiley, a co-founder of ComNet and senior partner at law firm Wiley, Rein & Fielding, will navigate the question-and-answer panel through issues including local exchange competition, long-distance entry, broadband access, spectrum auctions, 3G wireless, industry consolidation and homeland security.

Participating in the roundtable will be David A. Gross, deputy assistant secretary for international communications and information policy at the U.S. State Department; Andrew W. Levin, minority professional staff member in the U.S. House of Representatives; Kevin J. Martin, FCC commissioner; and Nancy J. Victory, assistant secretary of commerce for communications and information in the U.S. Department of Commerce National Telecommunications & Information Administration.

Spam wars

4 to 5 p.m.

It's the four-letter word no e-mail user can avoid: spam. Like the refuse that overflows our inadequate landfills, unsolicited bulk e-mail clogs the Internet and fills our in-boxes. ISPs spend millions of dollars fighting spam, and antispammers work to blacklist those who break acceptable use policies. But there are those who charge that it's censorship to block e-mail and say antispammer vigilantes have gone too far. In this session you'll hear from both camps. John Gallant, president and editorial director of *Network World*, will lead a panel including Todd Pelow, CEO of MonsterHut.com; Kelly Thompson, vice president of the Forum for Responsible and Ethical Email; and Ray Everett-Church, co-founder of CAUCE, an anti-spam group looking for a legislative answer.

THURSDAY JAN. 30

Ian Foster keynote address

10:30 to 11:30 a.m.

Ian Foster, head of the distributed systems laboratory at Argonne National Laboratory and professor of computer science at the University of Chicago, will share his ideas about The Grid, a project to aggregate and share computing power. Foster's expertise is in parallel programming, large-scale computing applications, distributed systems and high-speed networking. In this session, Foster will explain how service providers will be able to channel the resources of The Grid project to offer their customers a supercomputing experience.

Disaster recovery: What every network manager should know

1:15 to 2:15 p.m.

What are the elements of a good disaster-recovery plan? Who in your organization should be involved in creating or modifying corporate procedures? In this session, moderated by *Network World* Events Editor Sandra Gittlen, representatives from vendors with storage, security, and data back-up and recovery software will share their advice for a healthy disaster-recovery plan. Panelists include David Flynn, vice president of marketing at NetScreen Technologies; Tricia Jang, technical attaché for Tivoli storage, Tivoli Systems; and Julie Lucas, general manager of security solutions at Enterasys Networks.

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have yet to fade when reality starts to sink in: The deal has just been inked, but success now depends on your ability to figure out how to combine environments, integrate old systems with new ones, make disparate hardware and software work together. And while you're at it, make sure the whole infrastructure stays up and running.

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EDITORIAL

John Dix

Bluetooth home at last?

The success of Bluetooth depends, of course, on broad vendor support and the emergence of useful products.

Maybe we're reaching critical mass on both points. There have been a number of recent announcements that, taken together, show growing confidence in this point-to-point wireless technology.

That very definition is one of the things that has dogged Bluetooth. In a recent Frost & Sullivan study the majority of users described Bluetooth as a wireless LAN.

While some vendors are trying to stretch Bluetooth to provide LAN-like capabilities, it is principally a wireless technology for directly linking two devices — for example, connecting laptops to share files or connecting devices to cell phones. Establishing connections is easy and transmission, at 1M bit/sec, fast (see www.nwfusion.com, DocFinder: 7739).

The Bluetooth movement had been plagued by interoperability issues and general uncertainty about what role it should play, especially vis-à-vis 802.11b wireless Ethernet.

It now looks as if the industry is past those problems and has a clearer idea of where Bluetooth fits in. Vendors are placing Bluetooth bets, and interesting products are starting to crop up.

Take the Bluetooth hands-free car kit that Motorola announced at the recent Consumer Electronics Show (CES). The $200 kit automatically connects to your Bluetooth-enabled cell phone, regardless if the phone is in your pocket, briefcase or trunk and lets you field incoming and make outbound calls hands-free.

Motorola says drivers can use simple verbal commands to place calls, even if their phones don't support voice recognition. The kit supports 100 voice-activation numbers.

Similarly, Plantronics used CES to announce the M1500 cordless headset for cell phones.

You get a Bluetooth adapter that plugs into your phone and a headset, with a short boom mike that wraps your ear. Answer/end and volume and mute controls are located on the headset.

Perhaps most important, Palm used CES to introduce a beta-test version of a Bluetooth software developer kit. Approved by the Bluetooth Special Interest Group as being compliant with the Bluetooth 1.1 specification, the kit should help accelerate Bluetooth-compatible programs for this ubiquitous handheld.

And it doesn't end there. Bluetooth is showing up in everything from Hewlett-Packard notebooks to Sony video cameras. You can't help but get the feeling that the Bluetooth movement is gaining steam and here to stay.

— John Dix
Editor in chief
jdix@nww.com

opinions!

Achieving true CRM

The story "Twelve steps to CRM success" (www.nwfusion.com, DocFinder: 7724) should have been titled "Twelve steps for installing an IT system." To achieve true customer relationship management (CRM), you need to go far beyond a system; you need to synchronize, integrate and manage your organization and key operational processes around your target customers. CRM obviously involves an IT component, but without tying in your organization, its processes and your customers, your IT system is bound to come up short of expectations.

John Romero
Management consultant
Costa Mesa, Calif.

Don't blame Digital

Regarding "The HP/Compaq merger: The search for acceptance continues" (www.nwfusion.com, DocFinder: 7725): As a former Digital employee who was "assimilated" by Compaq in 1998, I can't remain quiet anymore after continually reading comments such as "Compaq still has a bad taste in its mouth from a largely failed buy of Digital Equipment a few years ago." Yes, Compaq did an awful job of integrating Digital and largely threw away its investment — but comments like this seem to imply that Digital somehow ruined a great company (Compaq). In reality, the strength of Digital's products and services are what kept Compaq in business.

Debbie Joy
Phoenix

Best defense

Thanks for your interesting feature on personal firewalls (www.nwfusion.com, DocFinder: 7546). As the story says, a firewall alone cannot protect the user's network. Users must realize the danger of security holes created by Web browsers or downloading and installing software from the 'Net.

Pave Kauranne
Helsinki, Finland

DMCA disagreement

I would have thought the track record of the Business Software Alliance (BSA), with its pseudo-threats and history of bully tactics, would be enough for anyone to laugh the BSA out of any debate. Regardless, I was pleasantly surprised to read BSA CEO Robert Holleyman's "No" response in your Face-off "Does the DMCA go too far?" (www.nwfusion .com, DocFinder: 7726).

Holleyman's feel-good marketing spin message sounds like an XP ad. And I wonder if he was not dreaming when he stated: "... the creation of the Internet does not demand we jettison the fundamental tenets of intellectual property protection enshrined in the Constitution. The reason we need new rules is to ensure those protections continue to be as strong in the digital age as they were in 1789."

History scholars, ignore for a moment that the U.S. did not recognize international copyright until well into the 19th century.

To ensure that the framers' intent is being applied, isn't it best to continue applying existing statutes to new situations rather than creating special-interest-backed, legal verbiage for every new business opportunity?

I applaud the editor's choice of Holleyman to write this affirmation of the DMCA. What better testament to the anticonsumer nature of this legislation than to have the head of the BSA as its spokesman?

Greg Crowe
IT director
FCC Commercial Furniture
Roseburg, Ore.

E-mail letters to jdix@nww.com or send them to John Dix, editor in chief, Network World, 118 Turnpike Road, Southborough, MA 01772. Please include phone number and address for verification.

More online! **www.nwfusion.com** Find out what readers are saying about these and other topics. **DocFinder: 7723**

PACKET EVANGELIST

Steven Taylor

Defining the many faces of VoIP

In a well-known fable, a group of blind men touch different parts of an elephant and each makes an accurate — but terribly incomplete — description of fundamental characteristics of the creature. Unfortunately, this is also true of most attempts to describe the voice-over-IP market today.

On the surface, voice over IP is simplicity itself: You take a voice conversation and transport it using IP. But that's where the simplicity ends. As long as IP is used somewhere in the transmission path, you're legitimately doing voice over IP. However, the implications, engineering and economics differ drastically depending on which parts of the transmission path are involved.

This spring, I'll be hosting a Network World voice-over-IP road show, and our first task will be to define the various network elements involved in a voice-over-IP implementation. (For more information on the voice-over-IP tour, go to www.nwfusion.com, DocFinder: 7727.)

We'll start with network infrastructure. Voice over IP often involves transporting information over an IP-based network. This may be the only place where IP is involved, with the people at either end of the call using traditional telephones. The primary emphasis of voice over IP is on cost savings for transporting traffic over one converged infrastructure.

Moving to the edge of the network, we find a plethora of products designed to take advantage of voice-over-IP cost savings via toll bypass. For instance, you could use an IP telephony-enabled router to connect your traditional PBX to an IP (or frame relay or ATM) core network for IP transport while still using your traditional PBX gear. In this case, voice over IP is used only for transport across the WAN between corporate sites. If an appropriate gateway is added, this voice-over-IP traffic can interconnect with the traditional public switched telephone network.

The third major domain for voice over IP is on enterprise premises. This is the realm of the IP PBX and the IP phone. Here, an entirely different set of economics may take over. Some of the LAN-based devices, such as cable/DSL routers with voice-over-IP capabilities and special phones for making Internet phone calls from your PC, are focused on toll bypass. However, the primary cost savings come from enhanced management and the "one pipe" theory of managing a single network within the company rather than two separate networks.

But even the IP PBX and the IP phones do not necessarily go hand in hand. You could have an IP-based PBX that supported traditional phones. Or you could use IP phones in an IP Centrex environment.

The voice network ultimately will be based on packet-data technology, probably with lots of IP in it. It will be a slow migration, with several disparate parts. The bottom line is you need to look under the covers before you make blanket statements about voice over IP and its success, failure or future.

Taylor is president of Distributed Networking Associates and editor/publisher of Webtorials.com. He can be reached at taylor@webtorials.com.

The voice network ultimately will be based on packet-data technology, probably with lots of IP in it.

ON SECURITY

Winn Schwartau

Cyber ethics in the workplace

While moderating a game of "Cyber ethical Surfivor" at a large, financial conference recently, I posed the following conundrum:

"You receive an anonymous e-mail which includes all the technical and business details of a key competitor's project. Your company is way behind. If you use the information, you will likely beat your competitor and you will be a hero. If you don't use the information, your company will lose a great deal of money and you will likely be the scapegoat. If you use the information, no one — except you — will ever know. What do you do?"

Most of the members of Team A said they would use the information. The first player set the tone, and all but one of the rest followed suit with slight variations on the rationale that "Business is war."

The members of Team B shook their collective heads. Every one of them said it was unethical, maybe illegal, to use the information, and there was no way they would resort to "cheating" to win, even with their livelihood on the line.

I was struck by two things: First, that the two teams were so diametrically opposed; and second, that there was almost no dissent among the members of each team, even though the players had been randomly selected from a large audience and didn't know one another.

The winner of that round was chosen through audience applause. Surprisingly, the audience was also split just about 50-50. (Ultimately, our judges had to decide.) However, in other cities in Europe and the U.S., the results from this same question have seen entire audiences and players lean strongly one way or the other.

Having run a few dozen Cyber ethical Surfivor games for the private sector, government, military and international groups, as well for hackers, I conclude that there is no cyber ethical consistency across the spectrum of computer users, security professionals, consultants, executives, military leaders and technical staff.

At the top of every information-security pyramid must sit policy; that boring set of guidelines and rules that human resources gives every employee. Most security-aware companies provide staff with a reasonable set of black-and-white policies: Do this; don't do this. However, policy guidelines do not address the gray areas.

The concept of adding cyber ethics to information security is new to most companies. Cyber ethics is a leadership issue, as I have observed in the games I have hosted on three continents. On every team a leader emerges who sets the ethos for the team through strong personality and communications skills.

Leadership is about culture, not management, whether we're talking at the corporate or national level. We know that poor user behavior can cause accidental security breaches, and what I've found is that much of this poor behavior comes from an ethical lack of understanding of the implications of one's actions.

We teach our employees not to open unknown e-mail attachments without scanning them first. But do we teach our staff not to read e-mail that arrives at their desk but that is intended for someone else? Where is the corporate line between cheating and competition? Do we give our staff enough ethical guidelines to know what is objectionable or offensive in a heavily multicultural workplace?

The first step in establishing a cyber ethical culture is to ask the really tough questions, the answers to which may be highly politically incorrect. HR, legal, security and top management need to work together to set the tone they wish to flow through their organizations. Sometimes this can be done through gaming; other times off-site meetings will work.

The second step is to include cyber ethical components in corporate security awareness campaigns to keep employees clued in.

The last but most important step is to be ready to make changes rapidly when cyber ethics becomes a component of information security efforts. Many of our ethical beliefs changed instantly on Sept. 11. We cannot predict how they will change tomorrow or next year — but we need to be prepared.

Schwartau is president of Interpact, a security-awareness consulting firm, and the author of many books, including the recently released Pearl Harbor Dot Com. *He can be reached at winn@interpactinc.com.*

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NetworkWorld Review

IP videoconferencing service providers

WireOne's Glowpoint packages IP net know-how to deliver the best elements of videoconferencing.

■ BY CHRISTINE PEREY, NETWORK WORLD GLOBAL TEST ALLIANCE

In the wake of Sept. 11, there's been a surge of interest in videoconferencing as a way to avoid traveling for meetings. Because many companies lack the time, money and expertise to build out robust videocentric services, many vendors are offering hosted services.

We tested six such services: InView IP Videoconferencing Services, WireOne Technology's Glowpoint, Reality Fusion's SeeSaw Distance Meetings, First Virtual Corp.'s (FVC) CUseeMe World, Eyeball Networks' Communicator and FocusFocus' Meeting. InView and WireOne offer guaranteed quality of service (QoS) over VPN links, while the other four rely on the Internet for WAN transport. A seventh vendor, Sprint, accepted our invitation but because of a series of internal obstacles on its part, couldn't complete the evaluation. We did not score it.

Because the two types of services are different enough, we awarded two Blue Ribbon Awards for this review. WireOne's Glowpoint won the Blue Ribbon Award for QoS-guaranteed IP videoconferencing services. WireOne's service and support staff met and in some cases exceeded our expectations.

For the Internet-based services, where proprietary applications are common and QoS guarantees are virtually absent, Reality Fusion's SeeSaw Distance Meetings service wins a Blue Ribbon Award. It met our business users' feature expectations and had good quality video and audio. We also found that Reality Fusion's service management portal gives network executives significant control over enterprise network traffic and the use of resources.

What's best for you?

The two types of services vary, having fundamentally different architectural issues. The Internet-based services are best for end users familiar with chat programs, who will be conferencing from their cubicles or offices. Employees likely would use the guaranteed network services in a conference room.

Only the guaranteed network services needed to submit a proposal and an analysis because they require a commitment of one year or more, and so we could compare the cost of outsourcing with an in-house deployment. The Internet-based services tend to charge on a pay-as-you-go basis (except FVC's CUseeMe World, which was free).

WireOne, which built its own VPN, responded to the request for proposal (see the RFP at www.nwfusion.com, DocFinder: 7721) within the 14-day window with a thorough proposal that included application-specific language and details ranging from network diagrams to sample service-level agreements. Nearly 60 days later, InView, which uses third-party network service providers, submitted its proposal. The in-depth proposal described the services that Savvis Communications, InView's network services provider, would deliver. InView also said the single point of contact for the customer would be the InView account manager.

WireOne's financial model was more clearly presented, and additional services were more economical than InView for similar services. The big difference was in the breadth of options and video services, such as periodic software upgrades, direct dial gateway services and call-forwarding features, included with WireOne's base package. InView does not use a gatekeeper to manage the customer's endpoints. WireOne technicians manage the Glowpoint network services via an H.323 gatekeeper. Network operations personnel have visibility into every endpoint registered with the gatekeeper and can build supplemental services, such as conditional and unconditional call forwarding, call routing for the ISDN gateway services and future custom features.

Provisioning and setup

Results varied with the ordering and provisioning of our circuits between WireOne and InView. After each local exchange provider brought in a line, WireOne promptly shipped a preconfigured Netopia router (model R5300) to each office with a small page that included all the IP addresses, subnet masks and gateway addresses. We installed the router and set up the videoconferencing endpoints and PCs in minutes.

For InView, we had to complete an IP address justification form, and once the circuit was ready, we needed a separate phone line for the carrier's access to a 33.6K bit/sec modem. Using the modem, remote technicians configured the Lucent DSU/CSU once the components were delivered on-site. Once the IP addresses were assigned, it took nearly two days at one location to troubleshoot the deployment before it correctly mapped in the service provider's WAN.

With the Internet-based services, the customer bears the provisioning issues. Each end user must obtain the client application and perform routine installations. We installed all the client applications we tested on multiple operating systems, and

Net Results

QoS service providers

4.3 RATING

WireOne Glowpoint

BLUE RIBBON WINNER

Company: WireOne, (888) 521-4569, www.wireone.com **Price:** Starts at $200 per month, per endpoint, plus installation fee. **Pros:** Rapid and professional installation/provisioning; excellent video and audio quality; standards-based equipment; integrated access and services package. **Cons:** Bandwidth cannot be used for applications other than H.323 videoconferencing; no data collaboration features.

3.8 RATING

InView IP Videoconferencing Services

Company: InView, (888) 283-1223, www.inview.net **Price:** Starts at $100 per month, per user without network services, or $350 per month, per user for 10 hours of services. **Pros:** Flexible converged network architecture; excellent video and audio quality. **Cons:** Gateway calls can only be made via multipoint conferencing unit; integration between backbone service provider and video application service provider needs work.

What's the score?	WireOne	InView
WAN management features 30%	4	3
Videoconferencing features 30%	5	5
Provisioning experience 20%	5	3
Data collaboration support 10%	1	5
Gateway services support 10%	5	3
TOTAL SCORE	4.3	3.8

Individual category scores are based on a scale of 1 to 5. **Percentages** are the weight given each category in determining the total score. ■ **Scoring Key: 5:** Exceptional showing in this category. Defines the standard of excellence. **4:** Very good showing. Although there may be room for improvement, this product was much better than the average. **3:** Average showing in this category. Product was neither especially good nor exceptionally bad. **2:** Below average. Lacked some features or lower performance than other products or than expected. **1:** Consistently subpar, or lacking features being reviewed.

Net Results

Internet-based service providers

4.3 RATING BLUE RIBBON WINNER

Reality Fusion SeeSaw Distance Meetings

Company: Reality Fusion, (831) 420-0520, www.realityfusion.com **Price:** $0.30 per minute, per connection. **Pros:** Extensive Web portal for account establishment and management, including many features for network managers; supports up to 150 users in one meeting; client graphical user interface attractive and highly functional; excellent audio and video quality, all tuned via SeeSaw Collaborator wizard; icons well designed for large group interactions. **Cons:** Connection establishment time frequently exceeded user patience (equal to or longer than 5 seconds); no data collaboration features; point-to-point session cannot be converted to multipoint.

3.7 RATING

Eyeball Video Communicator

Company: Eyeball Networks, (604) 921-5993, www.eyeball.com **Price:** Starts at $2,600 per year for five users in point-to-point or group communications. **Pros:** Audio and video quality sufficient for business meetings; well-integrated persistent chat application; rapid connection; easy to customize layout of windows on desktop. **Cons:** Lack of Web portal management of the service and accounts; services available at the time of this study designed more for consumer, not corporate applications.

3.3 RATING

FVC CUseeMe World

Company: First Virtual Corp., (408) 567-7200, www.fvc.com **Price:** Client is available for purchase via download or on CD-ROM; service is free. **Pros:** Widely deployed client and reflectors; good for getting your feet wet in videoconferencing. **Cons:** Features more appropriate for consumer than business applications.

2.4 RATING

FocusFocus Meeting

Company: FocusFocus, (818) 346-4200, www.focusfocus.com **Price:** $50 per month, per user; minimum of two seats. **Pros:** Tightly integrated chat and full-feature proprietary companion application for application sharing and synchronized Web browsing; easily added to any HTML page using one line of code; client very small and installs easily. **Cons:** Video quality and audio quality substandard, even with unlimited bandwidth on the last mile; firewall changes may be required for application to reach outside enterprise network; unattractive user interface.

What's the score?	Reality Fusion	Eyeball	FVC	FocusFocus
WAN management features 30%	5	1	1	1
Videoconferencing features 30%	5	5	5	3
Software client features 20%	4	5	5	3
Data collaboration support 10%	1	5	1	4
Worthiness of usage for enterprise 10%	4	4	4	2
TOTAL SCORE	4.3	3.7	3.3	2.4

Individual category scores are based on a scale of 1 to 5. **Percentages** are the weight given each category in determining the total score. ■ **Scoring Key: 5:** Exceptional showing in this category. Defines the standard of excellence. **4:** Very good showing. Although there may be room for improvement, this product was much better than the average. **3:** Average showing in this category. Product was neither especially good nor exceptionally bad. **2:** Below average. Lacked some features or lower performance than other products or than expected. **1:** Consistently subpar, or lacking features being reviewed.

found that with one exception (FocusFocus client doesn't support Windows XP), the vendors are prepared to support the range of desktop environments found in enterprise networks. We also were pleasantly surprised at how well each application used built-in Windows drivers to discover and configure the camera, speakers and microphone to maximize video quality and minimize echo.

The Eyeball Communicator client application is only 3M bytes in size, while CU-seeMe Pro and SeeSaw Communicator clients are in the 5M to 6M byte range. The FocusFocus client application came in at a lean 300K bytes.

We encountered difficulty from our Cap Gemini network location getting a videoconference through a firewall and proxy server combination with Internet-based services. Despite carefully following each vendor's recommendations, we couldn't complete a call from this location to any of the Internet-based services or to any of the other test sites. We did not encounter the firewall problems from the *Network World* test location.

In the meeting

There were dramatic differences between vendors training programs, with the QoS vendors boasting the most well-developed user orientation options. In

How we did it

Sixty days before the scheduled start of testing we invited 10 companies (V-SPAN, InView, WireOne, Sprint, Electronic Data Systems, Eyeball Networks, FocusFocus, First Virtual Corp., Reality Fusion and VideoNext) to participate. V-SPAN and EDS declined. VideoNext never responded to our invitation. In October, we invited NuVision, which declined.

For our guaranteed network service testing, we installed two identical H.323-compliant Polycom ViewStation FXs (running 6.0+ release of software) and 24-inch monitors at three locations (Placerville, Calif.; Southborough, Mass.; and Cambridge, Mass.). We also installed Tandberg 1000 videoconferencing appliances at two of these locations to test the interoperability of endpoints.

To test the Internet-based services, we installed Intel PC Camera Pros on Windows 98 SE, 2000, NT, Millennium Edition and XP operating systems running on 733- and 900-MHz PCs. For last-mile access, WireOne and InView included full and fractional T-1 circuits, respectively, provisioned by local exchange carriers (Verizon in Massachusetts and Pacific Bell in California). Sprint supplied T-1 circuits, but because of ordering and provisioning errors by Sprint, the services were never configured or tested as planned. The four Internet-based services entirely relied on the existing Internet access services at each facility: symmetrical DSL at one location and shared corporate network access from behind a firewall at the other two.

Testing phase

From Sept. 14 to Dec. 2, we tested user access via Web-based interfaces and videoconferencing application. We began with a service provider-hosted orientation, during which we were shown the service's features. We then used the videoconferencing appliances, applications and services in point-to-point and multipoint configurations. Our tests included scheduled multipoint calls, ad hoc calls, call forwarding (only available in the WireOne service offering), video operator assistance (only available in the WireOne service), gateway calls (on and off network, offered by WireOne and InView), data collaboration with a videoconference, and recording and streaming of a videoconference (using WireOne). We ranked video and audio quality on dedicated and converged networks and public VPNs.

The guaranteed network service providers were issued the same request for proposal, and their responses were evaluated on completeness, timeliness and professionalism.

We recorded and compared segments of video on the InView and WireOne networks at 768K, 512K, 384K, 256K and 128K using VHS Technologies in Cambridge.

With only three locations, we did not test scalability. And we didn't test privacy and security features beyond password-level protection.

Special thanks to Polycom, Intel, Tandberg, WildPackets Networks and NetIQ for their generous donation of time and equipment. The testing team included Jason Meserve, multimedia editor at *Network World*; Michael Pendleton of Cap Gemini Ernst and Young; and Christine Perey of Perey Research & Consulting.

both cases, we received demonstrations of scheduling portals and also discussed the user's ability to set up ad hoc calls with the Polycom ViewStation end-user application.

During point-to-point and multipoint calls we found varied quality from the Internet-based vendors. Regardless of the bandwidth available at the last mile, the sessions began with an active chat session in which we needed to adjust audio or reposition our Web camera to produce the best effects. We did not like the graphic design of the FocusFocus client application because it was too crowded and lacked graphic "treatments." CUseeMe Pro was more like a "light" application, in contrast with previous software clients the company has published. Eyeball's client was intuitive and elegant in the way multiple windows could be detached from the communications application interface and then reattached. SeeSaw's user interface is a stylish black navigation window with controls on the right and status indicators and meeting participant list on the left of the screen. We liked the use of icons to show the moderator and speaker roles, and the audio and video quality. From within the application a user can select a window and record the speaker's video, although unfortunately, the resulting .avi file does not include audio.

More online!

- A copy of the RFP we gave to the quality-of-service-guaranteed network service providers.
- A comprehensive description of our methodology for the tests.
- A network diagram of WireOne's Glowpoint and InView's services.
- An Eyeball chat screen shot.
- A video snippet of one of our tests.
- An online interactive buyer's guide chart of IP videoconferencing service providers.

DocFinder: 7722

Data collaboration, previously a common feature in videoconferencing client applications, was eliminated in CUseeMe, is not available in Eyeball or SeeSaw Communicator clients and is a plug-in for the FocusFocus application. The lack of support for data collaboration was a disappointment with WireOne's Glowpoint service. Because of strict filtering of all traffic on the service, users cannot establish T.120 sessions in parallel with the H.323 session. On the InView service, there were no traffic restrictions, permitting establishment of a parallel NetMeeting or Web conferencing session. The only element of "content" the user can introduce in a WireOne videoconference is by using the ViewStation's slide presentation mode, which converts PowerPoint content to a video signal and inserts it into the H.323 stream.

With the exception of FocusFocus, which did not offer a satisfactory multipoint usage scenario, the service providers could support meetings of four to five users comfortably. As the sizes reached beyond that, service providers offer continuous presence (permits all users to see one another in a tiled screen) using a multipoint conferencing bridge. An alternative to continuous presence is voice activated switching, which is available in the InView and WireOne services. In the case of SeeSaw Distance Meetings, Reality Fusion says it can support up to 150 participants in a single meeting, although only six can be seen on the screen at once.

Reaching beyond the boundaries

A final difference between the guaranteed network and the Internet-based services is interoperability between products and networks. For the guaranteed network services, a gateway can be introduced when a participant uses ISDN. We liked that WireOne offered a clear gateway dialing manual. We could initiate calls from the IP network through the gateway at the data rate of our choice (using a dialing prefix) to ISDN videoconferencing systems in our respective locations. With the Internet-based services, you can't interconnect users of different networks or services. Instead, you have to agree on a single network, download the same client application and meet on common ground.

Conclusion

We were impressed with the state of the IP videoconferencing services industry. The maturity of WireOne's Glowpoint services was clear in this study; in the near future, at least, other companies will find it difficult to match the reliability, efficiency and feature set that WireOne has developed. In the Internet-based services category, Reality Fusion's SeeSaw's performance dramatically exceeded our expectations, in the quality of the video/audio and the portal functionality. If you decide to pilot videoconferencing to employee desktops, you can't go wrong with Reality Fusion.

Perey is president of Perey Research & Consulting in Placerville, Calif. The company provides business development consulting services and conducts market research on the use of video in enterprise. She can be reached at cperey@perey.com

Global Test Alliance

■ Perey is also a member of the Network World Global Test Alliance, a cooperative of the premier reviewers in the network industry, each bringing to bear years of practical experience on every review. For more Test Alliance information, including what it takes to become a member, go to www.nwfusion.com/alliance.

Difficult choices for service providers

When implementing a videoconferencing-over-IP service, a service provider must make difficult choices that affect interoperability, quality, scalability, security, functionality and the building cost.

■ **LAN issues** — A service provider may rely on the existing LAN connection to a meeting room or desktop, or it may require a dedicated connection between the client and service provider. When using a corporate network for local access, congestion and security issues beyond the service provider's control can cause usability and performance issues. The service provider must also designate a point of presence where the LAN and WAN internetwork. On the other hand, when a service provider requires the installation of dedicated services, costs go up, and functionality (such as the ability to access resources on the LAN during a conference, or to use the bandwidth for a data application when not using for video) may be compromised.

■ **WAN issues** — The selection of wide-area transport infrastructures and development of network operations centers go hand in hand. When a service provider chooses a single WAN for all videoconferencing traffic, then servers may be distributed strategically in the network. This can reduce the need for overprovisioning. When a single network is selected, a quality-of-service-guarantee mechanism can be implemented across all segments, increasing the reliability of QoS and offering the option of service-level agreements. Finally, negotiating bulk bandwidth agreements with a single provider may reduce costs.

When a company remains neutral to the wide-area infrastructure, some of those advantages may be compromised. However, this lets the service provider choose the transport method depending on the customer, day or type of application, according to the costs, availability and QoS. A multinetwork service platform may also be more complicated to manage and requires that operations be more central.

Some companies choose to place their service platforms on the Internet. Disadvantages include security, stability and reliability (because traffic on the Internet fluctuates, and peaks are detrimental to real-time applications). But advantages are reach and cost. Anyone can reach the public Internet, and the cost is for access, not throughput.

■ **Standards** — For videoconferencing applications, the client has to capture and compress video and audio, and packetize the compressed data when placing it on an IP network. Many equipment manufacturers have adopted standards for video communications over IP (for example, H.323). But new standards (such as Session Initiation Protocol) are approaching and proprietary solutions persist. Proprietary solutions may take advantage of improved compression algorithms or be lighter in footprint.

If a service provider develops the service and client technologies as an integrated package, special features can be added or removed more quickly, depending on service agreements with customers. Designating the client application can also eliminate problems with supporting multiple software releases, conflicts with corporate network firewalls and other factors that could be outside the control of the service provider. In the majority of the cases where a private network service is offered, service providers expect the customer to purchase or already own client equipment that is compatible with the International Telecommunication Union protocols.

■ **Software-only or hardware-accelerated clients** — The customer's preferences determine if software applications on a multimedia PC with a Web camera are more appropriate than a hardware-accelerated appliance. The two extremes produce dramatically different experiences, primarily because the quality possible with hardware acceleration is considered more acceptable for group applications and most hardware-accelerated end points use a handheld remote to control the application. With a Web camera, you control the application via keyboard and mouse. Between these extremes, there are also standards-compliant "all software" applications available.

Because of these and other considerations, no two service architectures are exactly alike. For our review, we separated those services that use the Internet for transport from those that manage the WAN services and guarantee QoS to customers through partnerships with bandwidth providers or by using their own networks.

— **Christine Perey**

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NetworkWorld Review

CrossTec's NetOp Version 7.0

Encryption features and improved performance make this a worthy remote control tool

■ BY DAVID STROM

Any time we perform a comparative review, some worthy products are left out because of the limitations of reviewer time and magazine space. When we left CrossTec's NetOp out of our remote control shootout (see www.nwfusion.com, DocFinder: 7626), many of its fans wrote to tell us we'd left out a winner. The company recently shipped Version 7.0, adding a few new features, including encryption and a better browser-based client. If the new version of NetOp had been in the previous review, it would have scored well against its rivals, tying with Carbon Copy for second place.

NetOp offers the full array of connection options, including TCP/IP, NetBIOS, IPX and dial-up. Setting up the product is as simple as installing the software and answering a few questions. There are several outstanding features, some of which have been with the product for a few versions.

First, NetOp can be set up as a gateway host, meaning it can handle several incoming connections from modem and network users concurrently (Carbon Copy and ControlIT also allow this). Second, the chat feature immediately displays the text as it is being typed — other products only send a line at a time, after the user presses the enter key.

This is a small point, but it can be helpful when fast typists are communicating. There is also a markup pen that lets users draw on the screen to highlight different areas, something found in whiteboarding products but not usually in remote-control software. This feature is useful if a support person needs to show a user where to find a menu or command.

Also added to Version 7 is a Linux remote client and improved logging options. But the biggest improvement is the encryption features. These allow very detailed control over how communications between remote client and host will be secured. For example, you can turn off encryption entirely and then NetOp Version 7 hosts can communicate with older version clients. You can encrypt all data communications, or just keystrokes, between two PCs. The encryption tab under the guest-access security menu goes into more detail. These screens explain which elements of the connection will be secured, a nice feature if security is a major concern.

What about the Internet?

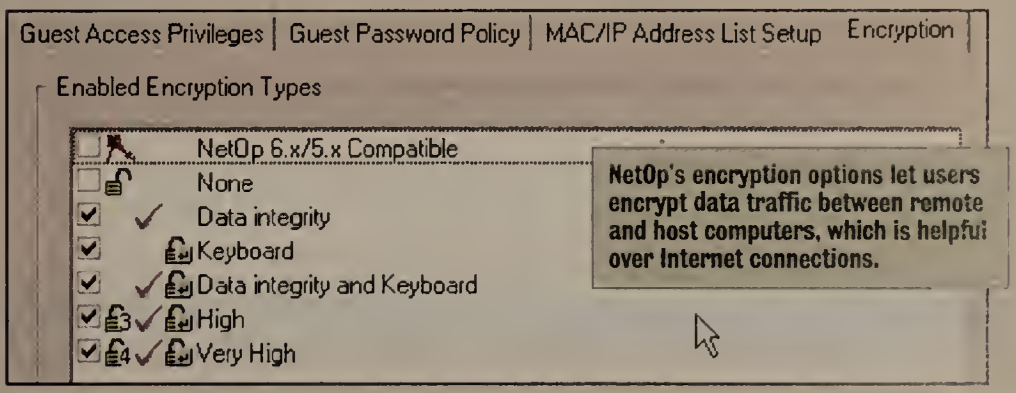
NetOp uses a special NetOp name server to locate your host computer, although like its competitors, you still need to open a port on your firewall to let communications go through. You can also set up your own name server on your local network if you are concerned about security and restrict access to your own corporate users.

We had some trouble with the new browser-based client, which uses a set of three files to run ActiveX control inside Internet Explorer Version 4.1 or better. On one Windows 98 test machine, despite changing the various ActiveX security settings in IE, we couldn't start a session. The feature worked fine on other machines running other operating systems. The browser client seemed to be a better performer than other browser clients from competing vendors, although we didn't benchmark this.

We also liked the overall snappy feel of NetOp: Graphics came up quickly over our Internet connection. We thought NetOp was as fast — if not faster — than pcAnywhere and Carbon Copy, with performance over a local Ethernet equivalent to sitting in front of the host.

Documentation was superb, and the manual was almost too complete. At 500 pages, it was probably the thickest, remote-control program manual we've seen. The manual could go into more detail delineating the difference between Internet and TCP/IP connection type, but that's a minor point. Every option and menu command is illustrated with copious examples.

Deploying NetOp on a corporate network can take several forms, and there are a variety of tools that come with the product to help. New to this version is improved integration with various database servers, although getting this setup properly is difficult and will take careful review of the numerous steps involved as documented in the



Enabled Encryption Types

- ☐ NetOp 6.x/5.x Compatible
- ☐ None
- ☑ ✓ Data integrity
- ☑ Keyboard
- ☑ ✓ Data integrity and Keyboard
- ☑ 3 ✓ High
- ☑ 4 ✓ Very High

NetOp's encryption options let users encrypt data traffic between remote and host computers, which is helpful over Internet connections.

■ Net Results

NetOp Version 7.0

4.05 RATING

Company: CrossTec (800) 675-0729, www.crossteccorp.com **Cost:** Single copy $179, volume discounts available. **Pros:** Flexible, capable and fast. **Cons:** ActiveX control still a bit shaky.

What's the score?	NetOp Version 7.0
Networking features 30%	4.5
Management/sec. features 25%	4
Ease of use/installation 25%	4
Documentation 10%	4
Price 10%	3
TOTAL SCORE	4.05

Individual category scores are based on a scale of 1 to 5. **Percentages** are the weight given each category in determining the total score. ■ **Scoring Key: 5:** Exceptional showing in this category. Defines the standard of excellence. **4:** Very good showing. Although there may be room for improvement, this product was much better than the average. **3:** Average showing in this category. Product was neither especially good nor exceptionally bad. **2:** Below average. Lacked some features or lower performance than other products or than expected. **1:** Consistently subpar, or lacking features being reviewed.

manual — this was about on par with its competition. Network administrators can take advantage of user authentication services provided by Windows Active Directory or NT Domain controllers so that you don't have to duplicate access control lists and groups with NetOp. You can also take advantage of a "silent install" similar to ControlIT.

This lets NetOp be deployed around a corporation without any active user intervention on its individual desktop computers.

Overall, NetOp is a fine competitor to the remote-control market. We recommend making use of the extra NetOp Security Server to set minimum password lengths and other security parameters. And you can't restrict individual users to particular folders, unless you set that up through their user rights on the host machine outside of the software. But these are minor quibbles. Overall, the product works and performs well.

Strom is the author of numerous product reviews, essays, opinion pieces and feature stories for dozens of computer trade publications and technical Web sites. His second book, Home Networking Survival Guide, *was published this fall. He can be reached at david@strom.com.*

How we did it

We installed the host and remote portions of NetOp on a variety of Windows PCs ranging in speeds from 200 MHz to 500 MHz, and running Windows 2000, 98 and XP. These computers were connected via a local 100M bit/sec Ethernet network or via dial-up 56K bit/sec modems. We looked at security features implemented, crispness of display, file transfer throughput and responsiveness of the remotely controlled host.

LapLink Gold Version 11.0

While LapLink is generally not thought of as a remote-control product, it can function in that way and the latest version offers some solid promise toward closing the gap with the traditional products such as NetOp and pcAnywhere. However, one feature that is part of the new version offers great promise but is poorly implemented: the ability for remote control sessions to transit corporate firewalls and to control machines across the Internet.

The goal is to let a remote LapLink user control a host that is sitting behind a firewall, without having to punch a hole for a particular port number sequence in that firewall. It is admirable, but their implementation is flawed. First, LapLink will only work if there is a single firewall between remote and host. If the remote user is behind their own firewall, such as connecting from a home computer on a network with a residential gateway, then this process won't work.

Even without this complication, getting the software installed wasn't easy, and we needed to place a few tech support calls and carefully read various online documents on LapLink's Web site. The problem is compounded by the remote and host users needing to work together to set up the appropriate name server listing, passwords and parameters. We don't see many people getting this to work at all, which is a shame because LapLink offers some real promise.

— David Strom

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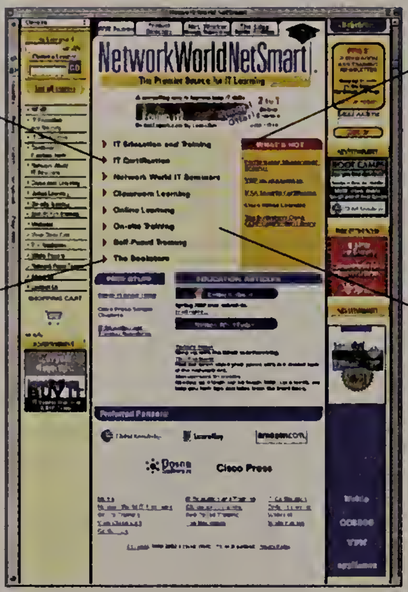

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■ **BY DREW ROBB**

The economy is finally showing signs of a turnaround, but IT spending is still tight. You've already made a few rounds of budget cuts and postponed projects, so what more can you do?

Now the trick is not in deciding where else you can trim expenses, but in wisely using available funds to improve service levels while creating a structure that provides long-term savings. Here are some tips for making smart IT investments.

David Arnold, systems engineer at Harrington Plastics, cuts IT costs by helping his users help themselves.

MARK ROBERT HALPER

1. Upgrade based on performance.

How often should you upgrade equipment? Unless older network equipment is creating a bottleneck, you may be able to put off buying new gear for a few more years. "Core routers and switches have become a mature technology approaching a five-year useful life," says Gartner analyst Lawrence Orans. "Server load balancers and Web site technology, on the other hand, have a two- to three-year refresh rate."

You should also take longer equipment life spans into account for leasing contracts to reduce the monthly payments.

However, Gartner still recommends a three-year refreshment cycle for PCs, finding that this reduces companies' total cost of ownership.

2. Tap vendors.

Vendors can often bring in considerable expertise based on hundreds of similar implementations. On occasion, that wealth of experience can be translated into an offer you can't refuse.

Take the case of Orange County, California. When its data center management outsourcing contract was set to expire last year, the county went through a request-for-proposal evaluation process. The organization considered several outsourcing arrangements in addition to transitioning services back in-house and in the end decided against regaining that responsibility.

IMS, now part of Affiliated Computer Systems, won the 10-year, $260 million contract by devising a way to turn the data center into a revenue source using 15,000 square feet of excess space. Under the agreement, IMS rents this space from the county, using it to serve other clients. Because the data center must operate around the clock but the county's IT employees aren't always fully utilized, those staffers serve other IMS clients, and the outsourcer pays the county for their time.

"With the revenue sharing, we are bringing into the county a significant revenue stream that we would not have been able to do if we had brought the operation in house," says Leo Crawford, assistant CEO of IT for the county. "This will help reduce the cost of providing services to county departments and agencies."

3. Help the help desk.

In 1996, the average help desk supported 25 applications. Now that figure is 200, according to Gartner analyst Kris Brittain. Therefore, few companies can do without help desk management software. These suites provide online data repositories to speed problem resolution, analysis of common problems and service-level tracking. Many also utilize the Internet and self-help functions for greater efficiency.

Harrington Plastics in Chino, Calif., started using Epicor Software's Clientele help desk program two years ago. "By moving toward a Web-based application, it keeps traffic down on the network and cuts down on phone calls," says David Arnold, systems engineer. "Users can go online and see how to solve their own problems."

Brittain says that implementing such help desk applications with a built-in self-serving database can reduce support costs from $50 to $60 per call down to $10 to $14.

4. Save space.

In addition to the price tag, equipment expenses include the space and electricity to run and cool the gear. While this money doesn't come directly out of the IT budget, the cost of renting more space and adding an extra air conditioner can pose another barrier to expanding server capacity.

One option is to choose a rack-dense "pizza box" server or server blade system from vendors such as Compaq, Dell, Egenera, Hewlett-Packard, IBM and Sun. For example, the Dell QuickBlade lets 200 to 300 servers fit in a single rack, instead of the normal 42 1U (1.75-inch) servers. These servers consume approximately one-fourth the power of a traditional server.

The Air Force's Center For Research Support (CERES) at the Schriever Air Force Base near Colorado Springs, went with dense servers when creating a storage-area network last year.

"We're not a large facility, nor do we get a lot of money every year," says Paul Barbara, CERES site manager for Lockheed Martin Mission Systems, which runs the site for the Air Force. "We have to cram a lot into a very small space and look at the bottom line."

Lockheed implemented nStor's NexStor 3150 servers, which fit eight 73G-byte hard drives into a 2U (3.5-inch) form factor. In this way, the center fit more than 1.5 terabytes of storage into 10.5 inches of rack space and can add another 7.6 terabytes to that rack as needs expand.

5. Put clients on a diet.

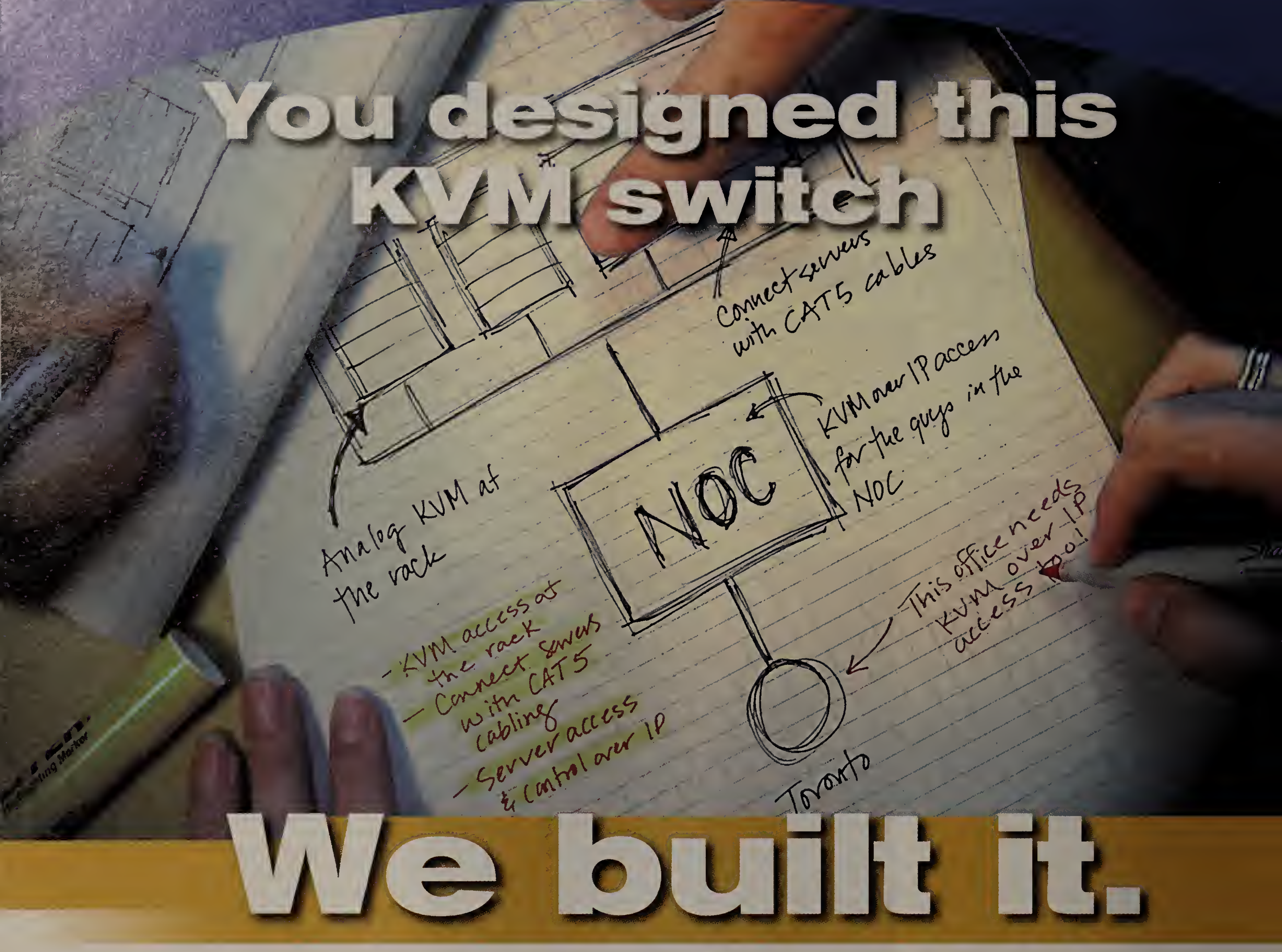
Some corporations are reverting to the mainframe model, moving applications off the workstation and onto the server. One advantage of the thin-client model is it extends the life of existing workstations or lets PCs be replaced with low-maintenance thin-client terminals. Along with hardware savings come reduced support and network costs.

Last November, Mike Haggerson, director of clinical IS for Detroit Medical Center, moved his 9,000 end users to a thin-client operation using Citrix Systems' Metaframe software. Hospital employees were using a 180M-byte application loaded on their hard drives to pull data from a several-hundred-terabyte medical records database.

"I had grown tired of managing it," he says. "Support was a nightmare." He set up an 80-server farm to centrally host the application, rather than having to support it on thousands of PCs.

Switching to a thin client cut bandwidth usage by two-thirds, eliminating the expense of future upgrades.

Robb is a freelance writer in Los Angeles specializing in technology issues. He can be reached at drobb@mediaone.net.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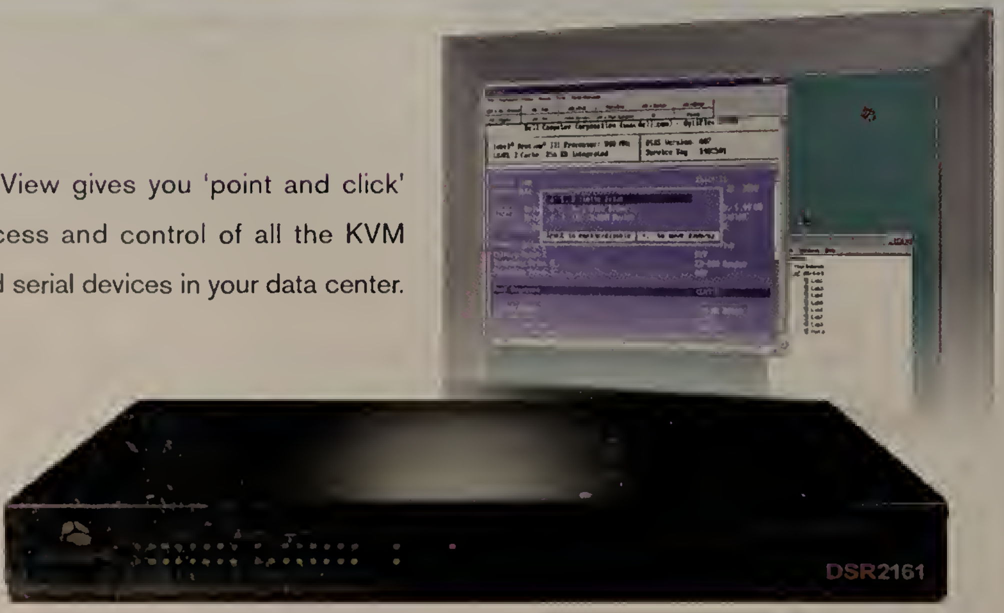

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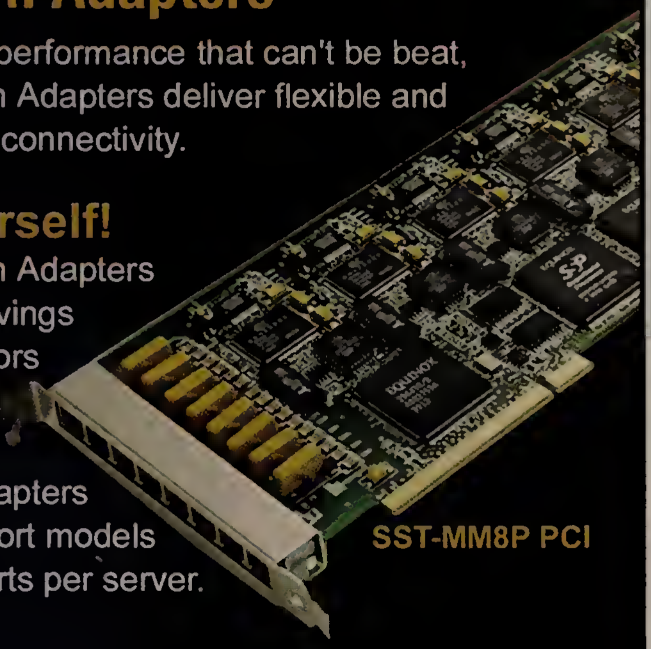
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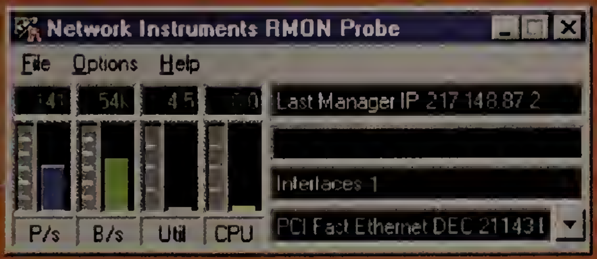

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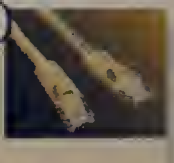

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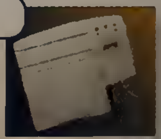

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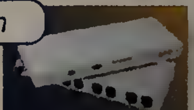

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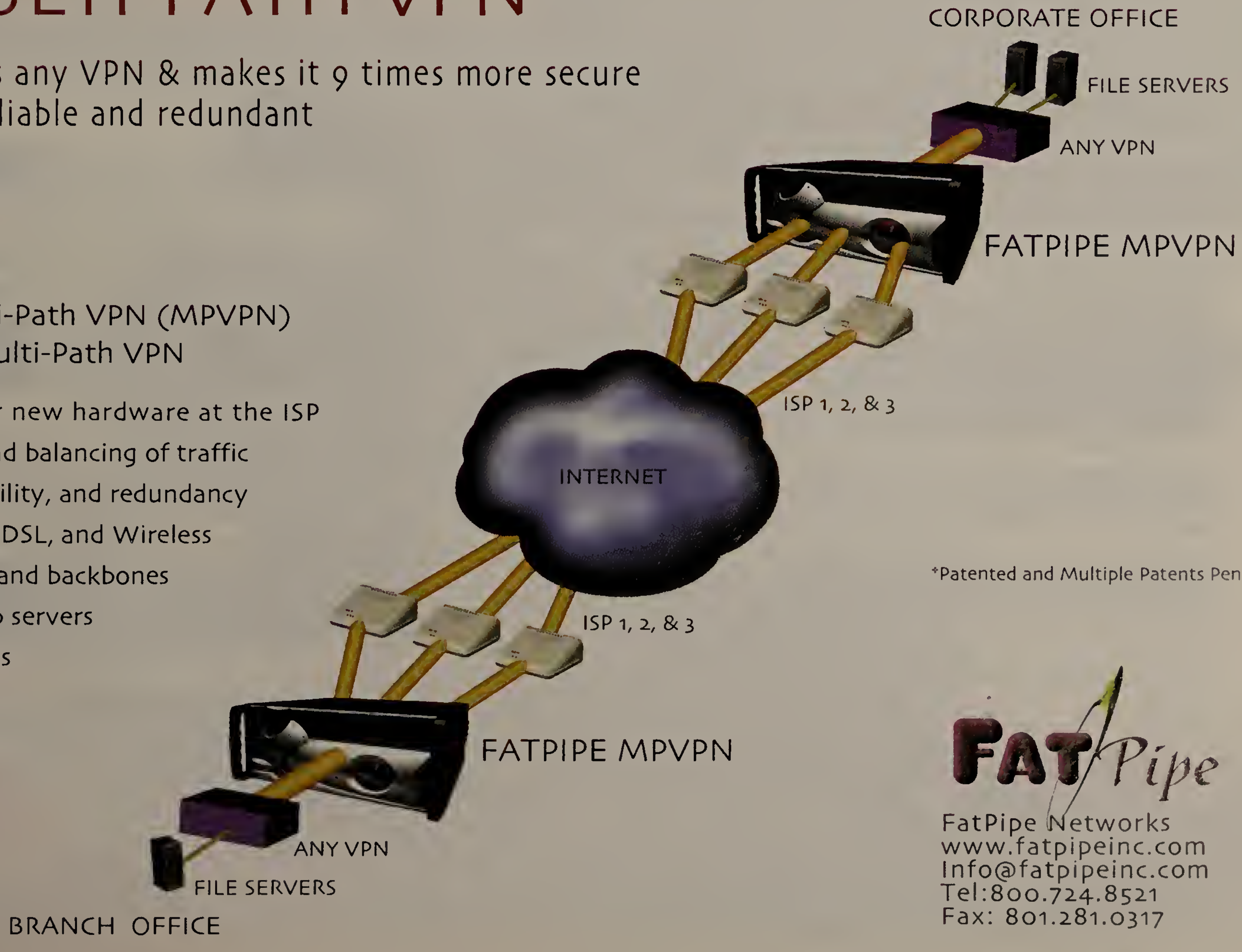

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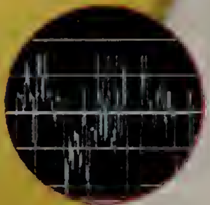

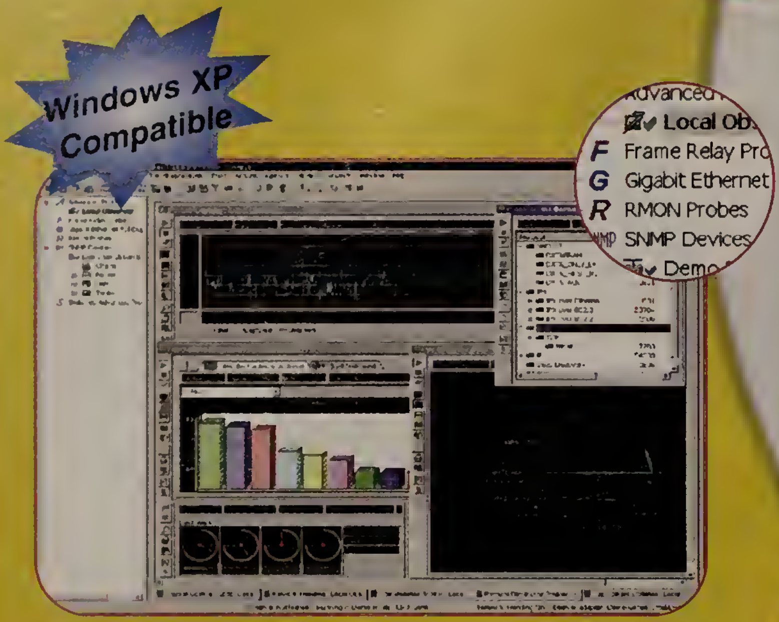

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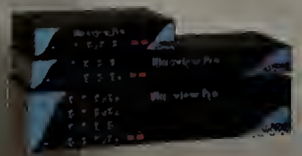

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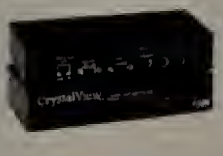

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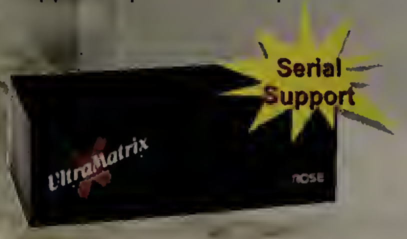

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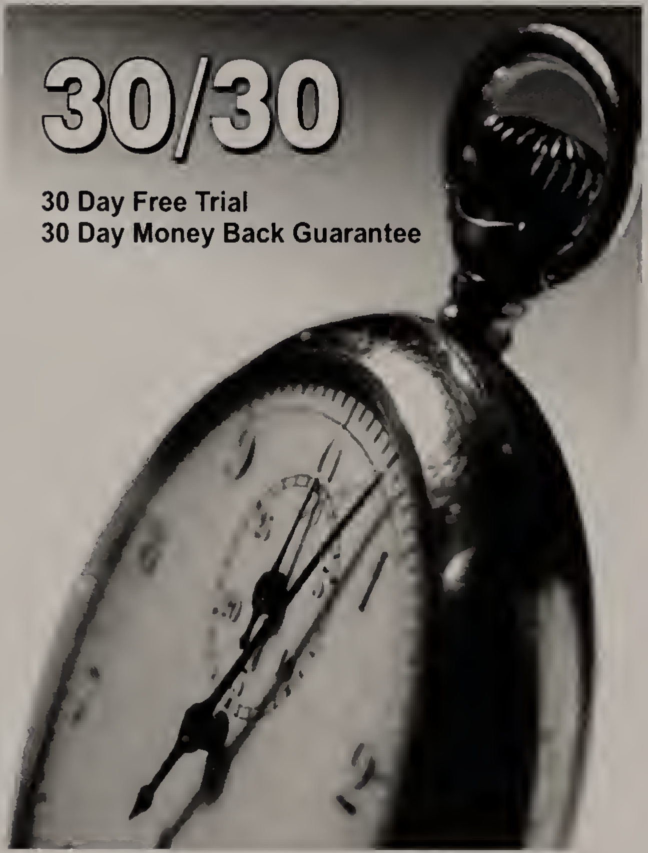

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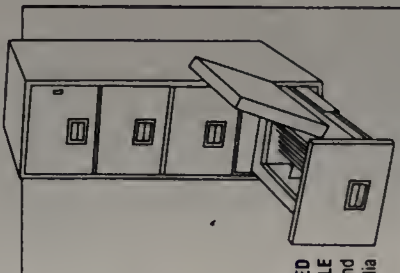

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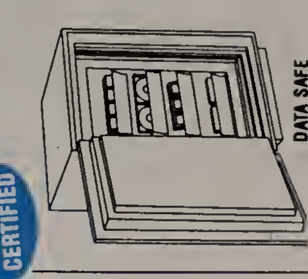

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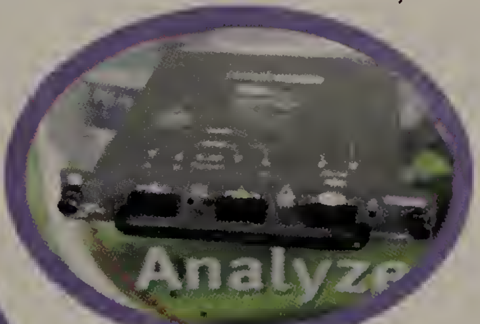

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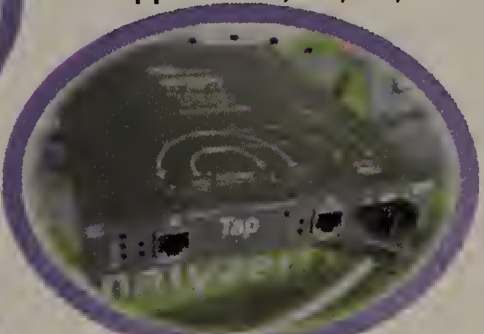

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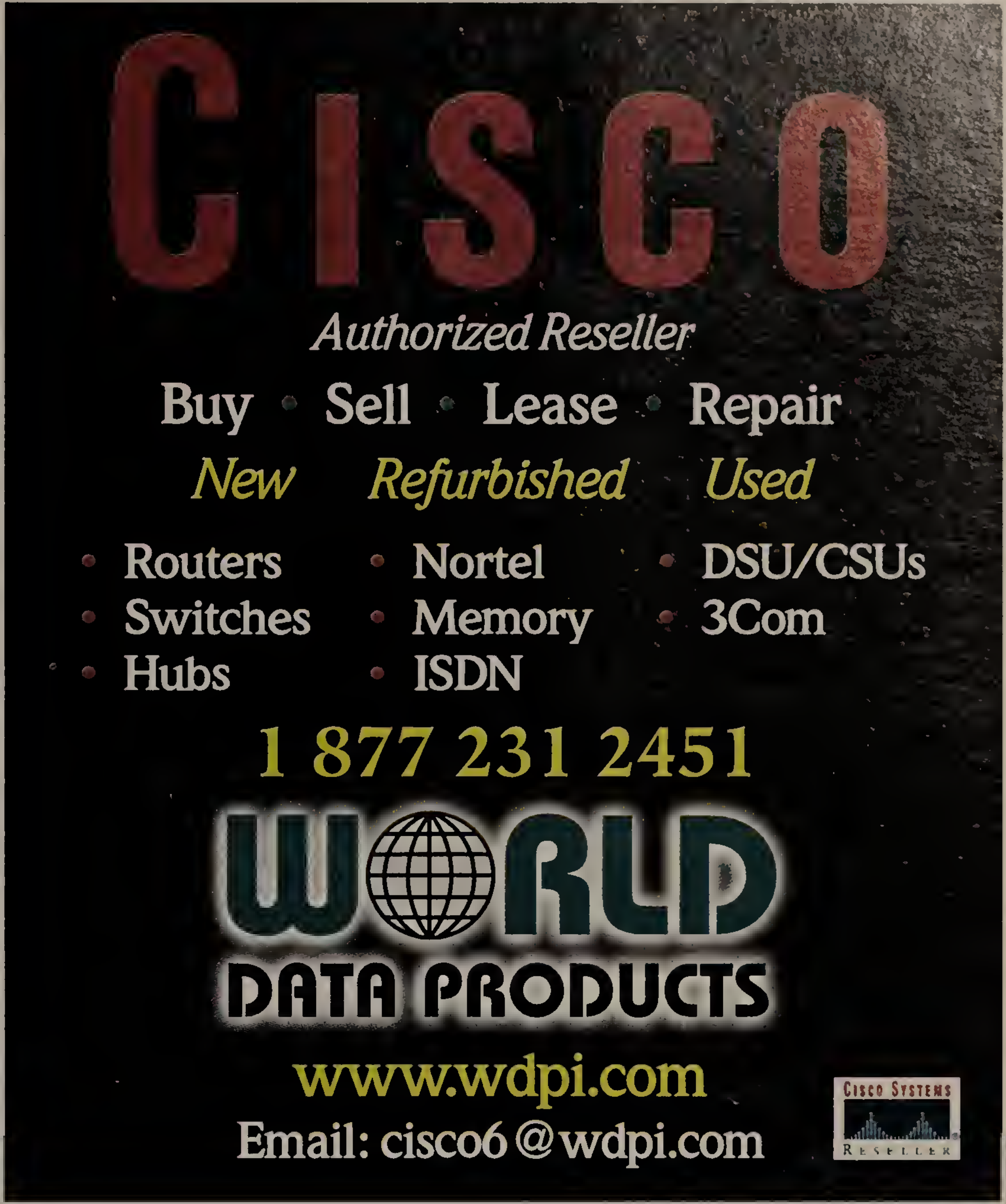
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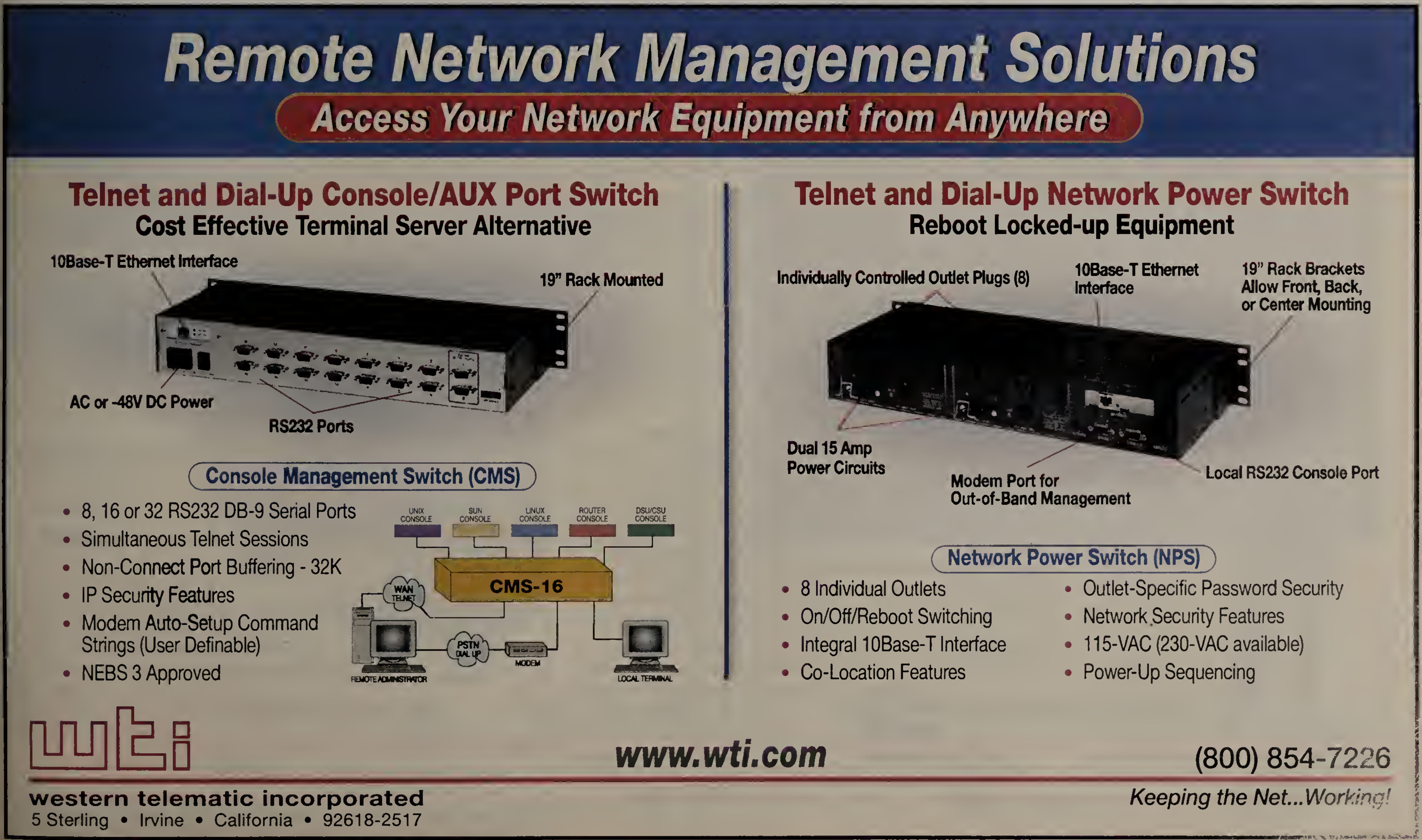
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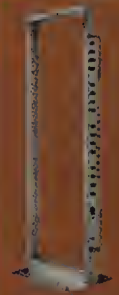

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Software Engineer: Wanted by optical networking system developer in Oceanport, NJ. Bachelor's Degree or equivalent in Engineering, Electronics, or a related field and a minimum of 5 years of experience in the job offered or 5 yrs. of experience in software development using Object-Oriented Design. Experience must include at least 2 years in Telecommunications industry. Respond to: Doreen Connors, HR Dept. (ref. #041), Tellium, Inc., 2 Crescent Place, Oceanport, NJ 07757.

Systems Analyst; $63K; 8a-5p 40 hrs/wk; Analyze, design, dev, implmnt, test & modify software sys & applics based on user reqmts using Visual C++, MS-SQL Server & Oracle; Masters or equiv in Computer Sc or Engg; Electronics, Electrical or related branch of Engg; Physics, Chemistry, Math or Statistics. In lieu of Masters, can have Bachelors in spec majors and 5 yrs of prog work exp as computer professional. Report or send 2 resumes: North Metro J.O # GA 7046248, 2943 N Druid Hills Rd, Atlanta, GA 30329 or nearest DOL Field Srv Office. Reference Job: RY

F/T Software Engineer. Responsible for creating Functional Specification documents based on design requests & producing & implementing High Level Designs for assigned functional areas. Perform Unit Testing on developed codes & troubleshoot defects found. Design & implement new modules in client server environment & maintain server modules written in C. Provide technical support to clients, evaluate business requirements & develop software & documentation according to established standards using Centura 1.1, Centura w/ embedded SQL, SQL, Sybase, Gupta SQL, MS SQL, Oracle & Visual Basic. Must have Bachelor's degree in CS, Info. Systems Engin., Computer Engin. or related field. Foreign degree equivalent accepted. Must have 3 yrs. of exp. in job offered or position w/ same duties. Salary: $62,920. Send resume: Betsy Moya, Sema, 701 Waterford Way, Suite 300, Miami, FL 33126.

F/T Software Engineer. Responsible for creating Functional Specification documents based on design requests & producing & implementing High Level Designs for assigned functional areas. Perform Unit Testing on developed codes & troubleshoot defects found. Design & implement new modules in client server environments & in the BSCS system. Provide technical support to clients, evaluate business requirements & develop software & documentation according to established standards using Centura w/embedded SQL, Gupta SQL, PL/SQL, C, C++, Pro*C, Unix & Oracle. Must have Bachelor's degree in Computer Science or related field. Employer will accept a Master's degree in lieu of Bachelor's. Foreign degree equivalent accepted. Must have 4 yrs. of exp. in job offered or position w/ same duties. Salary: $72,000. Send resume to Betsy Moya, Sema, 701 Waterford Way, Suite 300, Miami, Florida 33126.

Full-time Software Test Engineer. Responsible maintaining system performance, functionality & system integration and regression testing. Develop software test documentation & be responsible for the generation & execution of test cases & test plans. Work w/ Centura, SQL, SQL Plus, SQA, CMVC, TPS Builder & Java environments. Must have a Bachelor's degree in Computer Science, Electronic Engineering or related field of study. Foreign degree equivalent accepted. Must have 4 years of experience in job offered or position with same duties. Salary: $62,940. Send resume to Betsy Moya, Sema Group PLC., 701 Waterford Way, Suite 300, Miami, Florida 33126.

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Systems Analyst - IS/IT Prof. Consltng Svcs Co. in Piscataway, NJ. Bachelors degree in Comp. Sc., Engg. and 2 yrs. exp. reqd. Proficiency with C, C++, Visual C++, Rational Rose. Respond by resume to: (Ref. #GG7901), Subex Technologies, Inc., 255 Old New Brunswick Road, S240, Piscataway, NJ 08854. (no phone calls).

A Quality Assurance Test Engineer sought by company in Denver, CO specializing in business software solutions to work in Denver & other unanticipated job sites in the US. Engage in testing and quality assurance development work on financial software applications which run in an AS/400, Windows or environments, or are web-enabled. Specifically, test financial processes to determine if the applications meet general accounting, tax, and financial standards as well as localized standards. Identify problems and bugs and interact with programmers in problem resolution. Re-test the modified processes and applications, and certify that the problems have been resolved. Improve and document test plans and processes. Requires Bachelor's degree in business, finance or related field, including business finance or business administration; two years of experience in business software testing and development. 8am-5pm, M-F; $46,000/yr. (2 opgs.) Respond by resume to James Shimada, Colorado Department of Labor & Employment, Employment & Training Division, Tower II, #400, 1515 Arapahoe, Denver, CO 80202, & refer to Job Order Number CO5010603

IT Project Manager-Will work in various unanticipated locations throughout the US. Lead every aspect & entire development for IT projects & deliver them to clients within prescribed quality time frame, & budget: consult clients to clarify program objective; determine methodology & design approaches; guide team members with technical issues; integrate multi-site & multi-national systems; train, assign, & review work of programming personnel, prepare project progress report; recommend IT consultant hiring & inter-project employee movement. Principally use ADABAS, VSAM, NATURAL, PREDICT, MVS, JCL, Cobol, Unix, IBM mainframe, & Windows. Reqs: 4 yrs exp in a related occup as a Software Engg, Prog Analyst, DBA, Application Prog, or Programmer. Must have 4 yrs exp in development of comp systems & 2 yrs using at least half of the tools/platforms mentioned in the job description. $52/hr, 40 hrs/wk, 8a-5p, M-F. Mail resume to: Colorado Department of Labor & Employment, Employment Programs, ATTN: Jim Shimada, Two Park Central, Suite 400, 1515 Arapahoe Street, Denver, CO 80202-2117, & refer to order #CO5010756. Application is by resume only.

Senior Systems Developer - PAREXEL International, an int'l CRO, is looking for a Senior Systems Developer in our Boulder, CO office. Responsible for designing, testing, validating and maintaining distributed network clinical applications. Must have a MS or foreign equiv. in CS, MIS or a related field plus 2 yrs exp in clinical database and clinical software development. Send resumes to: hr@parexel.com or HR, 195 West Street, Waltham, MA 02451. PAREXEL is an equal opportunity employer.

F/T Software Developer. Responsible for researching, designing & developing computer software systems in conjunction w/hardware product development for Oracle applications, applying principles & techniques of computer science, engineering & mathematical analysis. Analyze software requirements to determine feasibility of design & consult w/ engineering staff & evaluate interface between hardware & software & operational & performance requirements of overall systems. Responsible for software system testing, procedures, programming & documentation working w/ Developer 2000, Pro*C, PL/SQL, Unix, Oracle V8, Report Writer 3.0, VAX/VMS & Ingres. Must have Bachelor's degree in Computer Science or related field. Foreign degree equivalent accepted. Employer will accept Master's degree in lieu of Bachelors. Must have 8 yrs. exp. in job offered or position w/ same duties. Salary: $85K. Send resume to Frank Stinger, Suntory Water Group, Inc., 5660 New Northside Dr., Ste. 500, Atlanta GA 30328.

F/T Software Engineer. Responsible for creating Functional Specification documents based on design requests & producing & implementing High Level Designs for assigned functional areas. Perform Unit Testing on developed codes & troubleshoot defects found. Design & implement new modules in client server & Java environment & maintain server modules written in C. Provide technical support to clients, evaluate business requirements & develop software & documentation according to established standards using Centura w/ embedded SQL, Cobol SQL, UNIX, Unix Shell Scripts & ORACLE. Must have Bachelor's degree in Computer Science or related field. Foreign degree equivalent accepted. Must have 3 yrs. exp. in job offered or position w/ same duties. Salary: $64K. Send resume: Betsy Moya, Sema, 701 Waterford Way, Suite 300, Miami, FL 33126.

6 openings available for a Programmer-Analyst to plan develop, test, Program, debug computer programs using various computer languages. Evaluates user request for new or modified program and analyzes, reviews and alters program to increase operating efficiency or adapt new requirement, and write documentation to describe program development, logic, coding, and Corrections. Bachelor Degree or its equivalence and two years experience in Computer programming. Salary $73,424.00. Send resume to Aptech Professional Solutions, Inc., 300 West Washington Street, Suite 1408, Chicago, IL 60606.

Programmer Analyst (2 positions) - Plans, develops, tests and documents computer programs, applying knowledge of programming techniques and computer systems. Design and implement computer based management system using C++, Rational Rose, Java and UML on both UNIX and Windows NT systems. Requires Bachelor in Computer Science, Engineering or Mathematics. Must have 3 years exp in the job offered or 3 years exp as a Software Engineer, Systems Engineer or Systems Analyst. Must have 1 yr exp using C++, Java, Rational Rose and UML on both Unix and Windows NT systems. 5 day, 40 hr/wk, $75,000/yr. Please mail resumes to Colorado Department of Labor and Employment, Employment Programs, ATTN; Jim Shimada, Two Park Central, Suite 400, 1515 Arapahoe Street, Denver, CO 80202-2117 and refer to order number CO5010412.

Business Systems Analyst: (Libertyville, IL) Configure business systems software; analyze business processes; design, develop and implement SAP's SD, PP, MM & Logistics modules perform scripting exercises; designs and configure the ERP system; design and configure Financial Business System software; design reports, forms, interfaces, custom programs and conversions; lead projects; execute system unit and integration testing including testing, configuration and error resolution; provide user training; identify business processes and system tasks to be documented.

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Programmer. Responsible for designing, coding and testing software, also responsible for programming by using C/C++ and JAVA language, developing new web-enabled customer service tracking system for international trade and service, modifying. updating and upgrading company's database, preparing unit testing and system testing documents as well as system maintenance. Salary: 45,000/yr, 40 hr/wk, 8:30 am-5:00 pm. Applicants must have completed grade & high schools, 4 years of college education with bachelor degree in computer science or related field and at least one year working experience for the job offered plus one year experience for the related occupation of system analyst. Applicants must show proof of legal authority to work in the U.S. Send resume to: Illinois Department of Employment Security, 401 South State Street - 7 North, Chicago, IL 60605, Attention: Shella Lindsey, Reference #V-IL 29632 - L, An Employer Paid Ad. No calls - send 2 copies of both resume & cover letter.

Java Programmer Analyst. Provide technical computer support and user assistance in developing, operating, and maintaining all web application programs for all divisions of Morley Companies, Inc.; maintain existing web applications; and prepare program documentation. Must have Bachelor's degree in Computer Science or related, and knowledge of AS400 platform, Web Sphere Application Server, and HTTP server for IBM, EJB, Java, JSP, and Java script. Send resume with cover letter to Morley Companies, Inc., Attn: Richard Mott, One Morley Plaza, Saginaw, Michigan 48603.

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Engineering Systems Analyst wanted by Cimnet in Downers Grove. Supervise software quality assurance product testing; train customers on systems operation; perform sample analyses of customer production work flow processes; perform analysis of customer systems data; develop, write and maintain technical documentation. Must have BA in Engg. or its equiv. & 6 yrs exp. in sys. analysis in the elec. manuf. indus. Respond to: HR Dept., 2651 Warrenville Road, Downers Grove, IL 60515.

Network Engineer wanted by DePaul in Chicago. Plan and design state of the art academic network facilities; provide and interface with mainframe systems ensuring appropriate access and security systems in-place; coordinate the development of remote access environment; prepare technical documentation on computer and office hardware/software; develop/maintain schedules and ensure proper maintenance of staff computing resources. Must have MS. in Compt. Sci. or equiv. & 6 mon. exp. & Microsoft certified sys. Engineer. Respond to: HR Dept. DePaul University, 1 E. Jackson, Chicago, IL 60604.

Systems Analyst - IS/IT Prof. Consltng Svcs Co. in Piscataway, NJ. Masters degree in Comp. Sc., MIS, Engg. and 1 yr. exp. reqd. Respond by resume to: (Ref: #GG7503), Subex Technologies, Inc., 255 Old New Brunswick Road, S240, Piscataway, NJ 08854. (no phone calls).

Software Engineer (Piscataway, NJ) - Design, develop, test and administer software including Unix, ServiceGuard, HP-IT/O, NNM, Trusted Systems, Oracle, Informix, C; and write, debug and implement code. 40hrs/wk, 9am-5pm. $60000/ yr. Min: Bachelors Degree in Com-puter Science/ Engineering. Send resume to: Prosario Systems, Inc., 143 Olive St, Piscataway, NJ 08854.

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Sr. Software Engineer: lead integration proj. with strong knowledge in Java, Corba, Ada, BizTalk, assembly, memory mgmt. M.S. in Comp. Sci. plus 2 yr exp. Send resume to HR, Integrated Solutions, 110 Wall St, Fl 7, NY, NY 10005.

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Systems Analyst - IS/IT Prof. Consltng Svcs. Co. in Piscataway, NJ. Masters degree in Comp. Sc., Engg. and 6 mo. exp. reqd. Proficiency with RDBMS, C, C++, Visual Basic. Respond by resume to: (Ref. #GG7432), Subex Technologies, Inc., 255 Old New Brunswick Road, S240, Piscataway, NJ 08854. (no phone calls)

General Manager, Director International Sales. Directs int'l sales/mktg. of computer components and executives/administrative personnel; obtains competitive position in industry throughout S. America/Europe/U.S.; allocates budgets; evaluates sales reports; communicates in Spanish/Portuguese/French with foreign distributors/buyers. Job in FL. Req. 4yrs. exp. Resume to Doron Miller at Computech International, 525 Northern Blvd., Suite #102, Great Neck, NY 11021. No calls.

F/T Software Engineer. Responsible for creating Functional Specification documents based on design requests & producing & implementing High Level Designs for assigned functional areas. Perform Unit Testing on developed codes & troubleshoot defects found. Design & implement new modules in client server environment & maintain server modules. Provide technical support to clients, evaluate business requirements & develop software & documentation according to established standards using Powerbuilder 7.0/PFC client & Sybase ASE, Sybase SOL, & Oracle 8i. Must have Bachelor's degree in Computer Science or related field. Must have 6 mos. exp. in job offered or position w/ same duties. Salary: $62,920. Send resume to Betsy Moya, Sema, 701 Waterford Way, Suite 300, Miami, Florida 33126.

IT Project Manager needed to manage IT infrastructure, research software apps., supervise tech. staff and manage implementation of new apps. including database admin. and version upgrades in Windows 2000/NT and Unix, Oracle, MS Office and Ouickbooks, MS Exchange, TCP/IP, networking, LAN, T1, DSL, IIS, Firewall, Clustering, among others. Must have BS in Comp. Sci. or Eng. or related discipline +5 yrs relevant exp. Reply to: S. Nemani, 4365 Rte. 1 South, Suite 110, Princeton, NJ 08540.

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SYST ANALYST for IT consulting co to design & dev application software for marine shipping & transportation industry; 35 hrs/wk. Must have Master's deg in comp sci, MIS, elec engrg or math & 2 yrs in job or 2 yrs software engineer exp. Contact Trade Ship, Inc., HR Dept., 201 Old Country Rd, Ste 202, Melville, NY 11747.

Senior Software Engineering positions available for qualified candidates possessing BS or equivalent and 4 yrs. relevant work experience. Work with 2 of the following: ERP, BPCS, CL/400, SOL400, AS/SET and RPG. Please mail resume to: VeryFine Products, Inc., Attn: HR, 20 Harvard Rd., Littleton, MA 01460. EEO/AAP

Sr. Technical Consultant - IS/IT Prof. Consltng Svcs Co. in Piscataway, NJ. Masters degree in Comp. Sc., Engg. and 1 yr. exp. reqd. Proficiency with RDBMS, C, C++, Centura. Respond by resume to: (Ref. #GG7456), Subex Technologies, Inc., 255 Old New Brunswick Road, S240, Piscataway, NJ 08854. (no phone calls).

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F/T Software Engineer. Responsible for creating Functional Specification documents based on design requests & producing & implementing High Level Designs for assigned functional areas. Perform Unit Testing on developed codes & troubleshoot defects found. Provide technical support to clients, evaluate business requirements & develop software & documentation according to established standards using Centura w/ embedded SOL, PL/SOL, Java, JavaScript, Java Swing, Java RMI, CORBA, SUN RPC, Solaris 2.x, & SunOS. Must have Bachelor's degree in Computer Science or related field. Employer will accept a Master's degree in lieu of Bachelor's. Must have 2 yrs. exp. in job offered or position w/ same duties. Salary: $64,000. Send resume to Betsy Moya, Sema, 701 Waterford Way, Suite 300, Miami, Florida 33126.

Sr., Technical Support Analyst wanted by Independence Blue Cross in Philadelphia to develop sftwre req's for major business info systems using Javascript & OOT. BA/BS (or equiv) req'd + 2 yrs relevant exp. Fax resume to G. Crawley 215-241-2068.

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Engineer II. Analyze & produce basic product designs/engineering data as defined by product specs for avionics products such as software and control instruments and displays for cockpit-man-machine interface; create software program design using Ada programming, object-oriented design methods, & Rational Rose software tools in a UNIX based Rational Apex environment along with the Virtual Prototypes Vaps tool on a Windows NT system; develop high and low level software interfaces with hardware for the ARINC 429, ARINC 708, and MIL-STD-1553B protocols; interface with hardware including the Permedia 3 graphics board, PowerPC 6.03 processor, Mini ACE MIL-STD-1553B chip and compact PCI bus; determine feasibility of design w/i constraints; test for conformance with specs; provide in-depth engineering support. Prerequisites: Bach. degree in engineering or related field, plus at least 2 yrs of exp. in job offered OR 2 yrs of exp. in design/development of software. Competitive salary. Job Location: Duluth, Georgia. Send resume to: Ms. Margie Raimer, ATTN: DOL-AD-1; BarcoView LLC; 3059 Premiere Parkway; Duluth, GA 30097-4905

Application Developers, VA Beach, VA: Software (Reynolds DMS & automotive products) apps design & object oriented development using Java, C#, Oracle, Visual Inerdev, VB, VC++, & ASP/IIS 5.0. Req. BS in computer science, engineering, or a related field and 2 years experience as a programmer, developer, or analyst. Resumes to: K. Cramer, Reynolds & Reynolds, Box 2608, Dayton, OH 45401

Full-time Architect. Responsible for providing technical support for database administration & for updating Oracle databases & initiation of new code path policies working w/ C, C++, Unix HP, SunOs, Oracle, OLE, Java, PL/SOL, UML, Visual Basic & ASP. Assist in developing databases for translation purposes & creating new applications to initiate new product releases to customers & database tables. Develop testing strategies, plans, conditions & analyze codes to determine database population & defects in customer's telecommunications billing software. Install & assist w/ upgrades for in-house translation tools, provide support for translation issues & create functional design specifications for software enhancement. Must have Bachelor's degree in Computer Science or related field. Foreign degree equivalent accepted. Must have 2 yrs. exp. in job offered or position w/ same duties. Salary: $70K. Send resume: Betsy Moya, Sema, 701 Waterford Way, Ste. 300, Miami, FL 33126.

Engineer

Pitney Bowes, Inc. has an opening in its Shelton, Connecticut office for an Engineer.

Support senior personnel investigating internet security threats and countermeasures and determine how new product concepts should be designed in order to achieve required security levels. Support the creation and evaluation of new internet and network product concepts. Participate in technology investigations, including secure coprocessors, biometrics, formal methods, design methodology for secure systems, power signature analysis, virtual private networks and classical cryptographic algorithms.

Must possess at least a bachelor's or its Equivalent in Computer Science, Electrical Engineering or a related field. Classroom Training or experience with algorithm, analysis, scientific computing and advanced numerical analysis programming using Matlab and Maple, math background in field and number theory, assembly language programming and knowledge of UNIX and LINUX administration is required.

Resume and/or cover letter must reflect each requirement above and specify reference code E1 or it will be rejected.

Forward resume to Robbin Drew Elliott, Pitney Bowes Inc., One Elmcroft Road, Stamford, CT 06926-0700.

Systems Analyst

Pitney Bowes has an opening in its Stamford, Connecticut office for a Systems Analyst.

Responsible for the successful design, development, implementation, support and troubleshooting of the Company's major business computer applications, including billing and invoice generation. Work with end-users to determine both the business requirements of these systems and how to interface these new systems with the Company's existing hardware and software. Oversee and coordinate related development, testing and implementation activities. Codes in COBOL, Easytrieve, JCL, Transform, SOL, IMS and DB2.

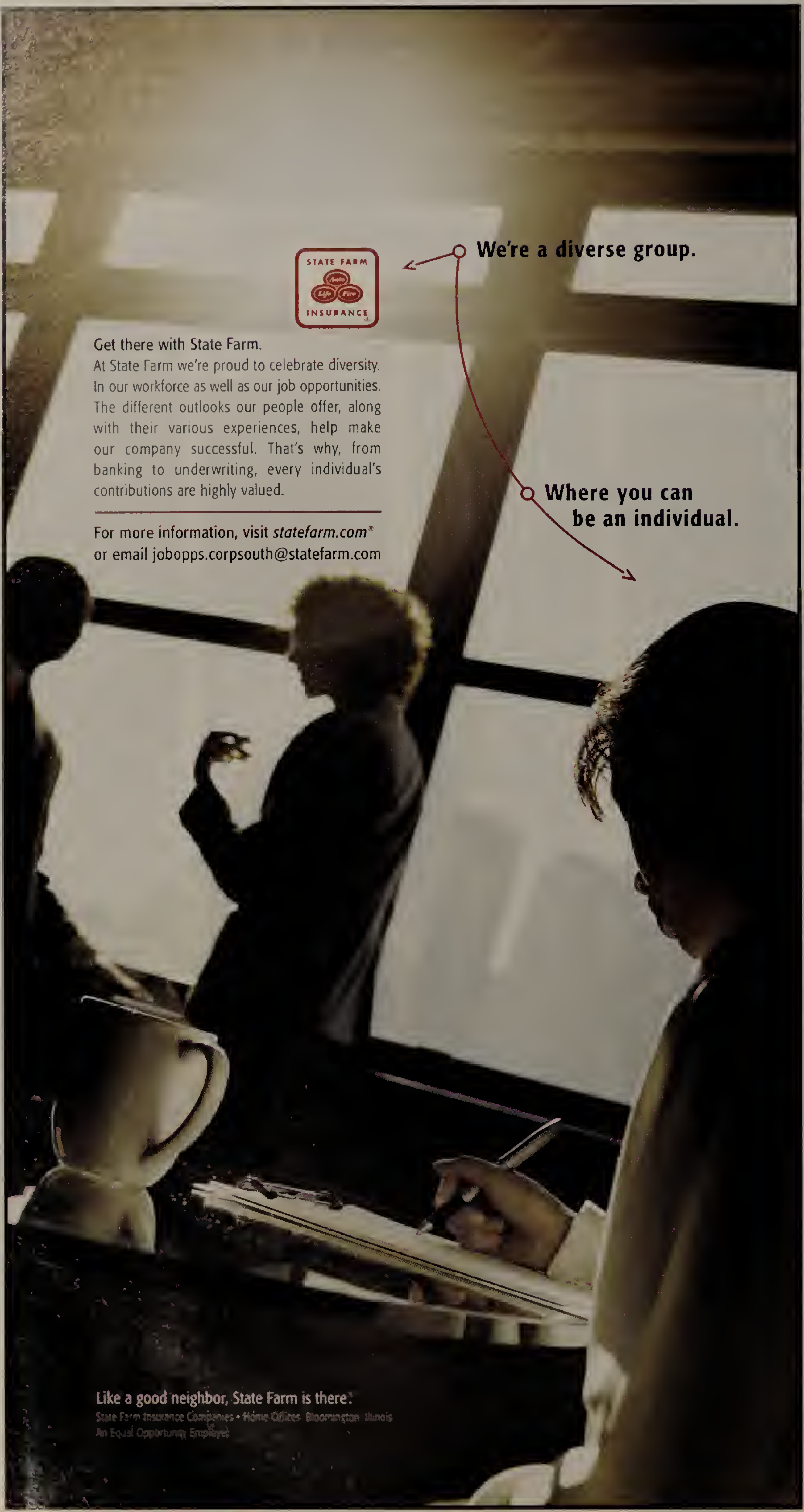
Must possess at least a bachelor's or its equivalent in Computer Science, Engineering, Math or a related field and relevant experience as a Programmer Analyst, as well as experience with the full software development lifecycle including heavy design and COBOL, Easytrieve, JCL, SOL, IMS, DB2 and Transform or a related system (i.e. IMS DC).

Resume and/or cover letter must reflect each requirement above and specify reference code SA or it will be rejected.

Forward resume to Robbin Drew Elliott, Pitney Bowes Inc., One Elmcroft Road, Stamford, CT 06926-0700.

Quality Analyst, Bohemia, NY: Exercise authority in OA matters that affect product or service quality. Verify, validate & analyze production work. Audit the outside connectivity of production sites. Verify, validate & analyze product design & functionality according to documented instructions, including new building testing. Compose and/or update test scripts, test plans, work instructions, forms, & other documentation. Administer OA test websites. Upgrade & maintain third party software used by OA, including browsers, antiviral software, operating systems, file-sharing software & server management programs. Document all defects, problems or opportunities for improvement. Work with Account Management group to provide technical support. Bachelor's degree or equivalent in Information Systems or Computer Science & 2 yrs exp. in IBM PC's, Windows, & commercial automated software tools such as Winrunner & in web and/or software testing such as unit tests, integration tests & regression tests. Alternatively, the employer will accept a qualified applicant with 4 yrs exp. in the position offered or in related systems analysis position. 4 yrs exp. must include exp. in IBM PC's, Windows, & commercial automated software tools such as Winrunner & in web and/or software testing such as unit tests, integration tests & regression tests. Send resume to Karen Parente, Direct Insite, 80 Orville Dr. Bohemia, NY 11716.

Senior Oracle Database Administrator (Atlanta, Georgia) -Technical lead responsible for all aspects of Oracle database administration on Windows NT and UNIX, including stored procedure development, PL SOL coding, testing, tuning and physical implementation of production and development databases. Design systems, interfaces and data conversion programs consistent with company enterprise data architecture. Support production databases and interfaces for SAP administration, including financials and supply chain modules, custom enterprise software and web-based software. Will supervise other DBA's. Must have a Bachelor degree or equivalent in Computer Science or related field. Experience may have been obtained concurrently and must include: (i) 5 years of experience in the job offered OR 5 years of experience as Oracle Database Administrator on Windows NT and UNIX; (ii) 5 years of experience each in PL SOL and production DBA support (iii) 3 years of experience in SAP Basis Administration; and (iv) 1 year of experience each in Oracle 8i and data conversion. Must also be certified in Oracle Database Administration, UNIX Administration, and SAP Basis Administration. Must have legal authority to work in U.S. Send resume to: Alison Reed (REF: SODA), 4751 Best Road, Suite 480, Atlanta, Georgia 30337.



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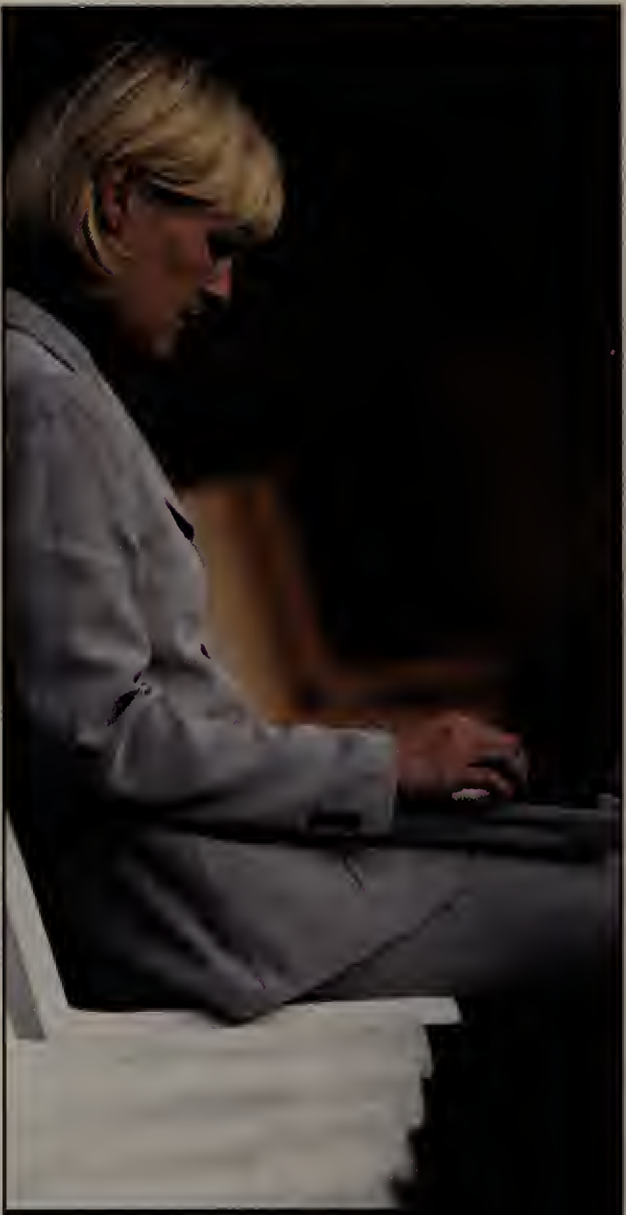

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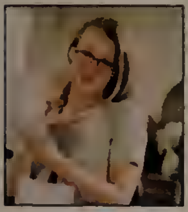

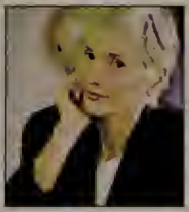

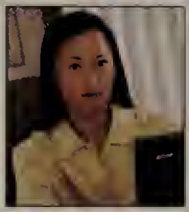

Advertising Supplement

Diversity in the IT Field

By Jennifer Hicks

Diversity in the information technology industry is nowhere close to where it needs to be. Harris N. Miller, president of the Information Technology Association of America spoke before the U.S. House Committee in March of 2000. The statistics he cited were alarming:

- African Americans represented 5.4 percent of all computer programmers and 7.1 percent of computer systems analysts—two of the core jobs in the industry
- Hispanic Americans held 4.6 and 2.5 percent of these jobs, respectively.
- Native Americans represented only .2 percent of the total science and engineering labor force, yet they represent .7 percent of the total U.S. population.

In 2001, not too much changed. Although there were a significant number of African Americans in IT, "not that many have arrived at positions of power and decision-making," says Renee McClure, national president of Black Data Processing Associates.

And, with the recent stumbling economy, there's been a 44 percent drop in demand for IT workers in the U.S., according to the Information Technology Association of America.

The Information Technology Industry Defined

In its narrowest sense, the information technology industry is defined as those organizations concerned with furthering computer science and technology, design, development, installation, and implementation of information systems and applications. Yet professionals versed in any of those areas fit into every spectrum of the economy. And, because of this, even given the economic downturn, there are still some jobs where IT professionals are in great demand.

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Computer Systems Analysts, Engineers, and Scientists

The need for systems analysts, engineers, and computer scientists is acute. In fact, this group ranks among the top 20 in the number of new jobs created through 2008, according to the 2000-2001 edition of the Occupational Outlook Handbook (OOH). While found in every sector of the economy, many computer analysts, engineers, and scientists are concentrated in the computer and data processing services industries—either as employees or independent contractors.

Programmers

There are two broad types of programmers—those who deal with systems and those who deal with applications. Employment of programmers is expected to grow between 21 percent and 35 percent through 2008, according to the OOH. Although programmers are found in every industry, the largest concentration is in the computer and data processing services industry.

Opportunity for Advancement

For seasoned IT professionals, promotions can be difficult—unless your employer provides training opportunities. Technology changes rapidly and unless one has up-to-date skills and training, moving up the corporate ladder can be impossible. Those organizations that provide access to training—and thus "grow their own" IT pros—are also more likely to make career advancement possible within their organizations.

Perceptions of Those in the Field

A 2001 survey by the Information Technology Association of America, *IT Magazine*, and *U.S. Black Engineer* found that the primary reason people entered the IT field was for training opportunities and professional development, followed by salary and benefits.

African Americans were the primary respondents (78 percent) to the survey, followed by white Americans (10 percent), Asian Americans (7 percent), Hispanic Americans (3 percent) and Native Americans (1 percent). Fifty-five percent of the respondents were men and 45 percent were women.

Men cited early exposure to the industry as the reason for entering; women cited prior work experience. The report surmised that we should "be mindful of how young persons in target populations encounter technology" and that we could face serious consequence if we don't introduce girls to technology at the same rate we do boys. Many respondents also said they believed many women and minorities were not aware of opportunities within the industry and suggested that more internships and mentoring could help raise awareness and interest.

Based on sales, profits, assets, and market value, the following companies, arranged in descending order, are the IT leaders, according to *Fortune Magazine*.

IBM
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Compaq
Intel
Dell
Microsoft
Tech Data
Electronic Data Systems
Cisco
Xerox
Sun Microsystems
Solectron
Texas Instruments
Oracle
Gateway
Computer Sciences Corporation
EMC
Apple Computers
Micron Technology
America Online
Unisys
Seagate Technologies
Automatic Data Processing
Computer Associates International
Science Applications International

Author bio:

Jennifer Hicks, author of several hundred articles and who lives in the Boston area, is the director of online content for IMDiversity.com http://www.imdiversity.com, the Web site where opportunities, careers, and diversity connect.

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Editorial Index

360Commerce 12
3Com 6

A
AfterBOT 12
Agilent Technologies 1
Akamai Technologies 6
Apogee Software 1
Arch Wireless 6
Avaya 10

B
BEA Systems 30
BellSouth 34
Browse 3D

C
Cable & Wireless 6
Cisco 10, 17
Commerce One 6
Compaq 6
Conxion 33
Corrigent Systems 35
CrossTec 53

D
Digital Island 6

E
EMC 17
Enterprise Storage Group 17
Exodus Communications 6
Eyeball Networks 49

F
First Virtual 49
Fluke Networks 1
FocusFocus 49

G
Globix 6
GoAmerica 33

H
Hewlett-Packard 6, 17

I
IBM 1, 30
Inrange Technologies 17
Ingrain Networks 17
Integral Access 35
Intel 6

L
Looking Glass Networks 33

M
Matrix.Net Systems 1
Megisto Systems 8
Microsoft 1, 20, 40, 74
Moxi 40

N
Nauticus Networks 17
Neoteris 1
Netilla Networks 1
NetSilica 1
NextWave Telecom 34
Niksun 1

O
Ocular Networks 35

P
Palm 6
Phonetics 1
Pirus Networks 17
Proxim 6

R
RapidStream Networks 17
Reality Fusion 49
Response Networks 1

S
SAP 6
SchlumbergerSema 25
Siebel Systems 25
System Management Arts 1

T
Tellabs 35
Teltronics 1
TeraBurst Networks 35

W
Western Multiplex 6
Wind River Systems 6
WireOne Technology 49

Y
YellowBrix 25

Advertiser Index

Advertiser	Page #	URL
Adtran	31	www.adtran.com
AT & T	21	www.attbusiness.com
Avocent	56	www.avocent.com
Buyuptime.com	58	www.buyuptime.com
Cisco	11	www.cisco.com
Computer Associates	2-3	www.ca.com
Cyclades Corp	57	www.cyclades.com
Dell Computer Corp	13	www.dell.com
Equinox Systems Inc	57	www.equinox.com
Executive Software	9	www.execsoft.com
FatPipe Networks	59	www.fatpipeinc.com
Fluke Corp	15	www.flukenetworks.com
Global Technology Associates	62	www.gta.com
Hergo Ergonomic Supplies	58	www.hergo.com
Hewlett Packard	44-45	www.hp.com
IBM	26-27, 52	www.ibm.com
Intel Corp	76	www.intel.com
Maxtor Corp	24	www.maxtor.com
Microsoft Corp	38-39	www.microsoft.com
Net Optics Inc	61	www.netoptics.com
Network Instruments	57, 60	www.networkinstruments.com
Network Technologies	63	www.nti1.com
Novell Inc	22-23	www.novell.com
Opalis Software	64	www.opalisrobot.com
Princeton Softech	7	www.storesmarter.com
Recortec Inc	64	www.recortec.com
Rose Electronics	60	www.rose.com
RSA Security Inc	36	www.rsasecurity.com
Server Technology	64	www.servertech.com
Sharkrack	62	www.sharkrack.com
SilentRunner	64	www.silentrunner.com
Sungard Recovery Services	18-19	www.sungard.com
Toshiba America Inc	4	www.toshiba.com
*Veritas	48	www.veritas.com
*Verizon	32	www.verizon.com
Websense	75	www.websense.com
Western Telematic Inc	63	www.wti.com
World Data Products	63	www.wdpi.com

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BoostWorks
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SSL

continued from page 1

much as IPSec VPNs. In particular, they don't support legacy client-server applications. But even stripped down as they are, they handle most of the traffic VPNs typically support.

The SSL model works for the majority of end users, according to Zeus Kerravala, an analyst with The Yankee Group. "For the 80% of users that need access to only 20% of corporate information, it is very useful."

How these vendors do what they do varies. But they rely on SSL, the security protocol that is already on most corporate PCs outfitted with Web browsers and used for Internet monetary transactions. These remote machines require no additional software installation or maintenance. SSL provides 168-bit encryption, the same strength as Triple-DES encryption used with IPSec.

Suit yourself

Users must weigh their particular needs to determine whether SSL or IPSec is the better technology for them.

IPSec pros:

- ▲ Very secure
- ▲ Standards-based
- ▲ Good for all IP traffic

IPSec cons:

- ▼ Interoperabilty issues
- ▼ Maintenance costs
- ▼ Not ubiquitous

SSL pros:

- ▲ Low maintenance cost (already in browsers)
- ▲ No client maintenance
- ▲ Good interoperability

SSL cons:

- ▼ No support for real-time applications
- ▼ No file sharing

These vendors also rely on servers that sit between the remote PC and the server storing data on the corporate LAN. This intermediary server sets up an SSL connection with the remote machine, then patches that Web link together with a link to the data server. It also buffers the corporate network from the Internet. This secure Web traffic comes through the corporate firewall via a single SSL port that can be set to allow access only to the intermediary server.

By contrast, IPSec remote access requires a remote client that has to be configured with the right security parameters. Installing and maintaining hundreds or thousands of them in a corporate VPN can be a nightmare, Finisar's Wilson says. The secure tunnels between the clients and a VPN gateway must be integrated with the firewall, a source of more work for the IT staff.

Of users that do not have IP VPNs, one-third said they don't because they are happy with their current access networks, while about 13% said IP VPNs are too complex and 14% said the technology isn't mature enough, according an IDC study.

The same study says that by year-end, nearly three-quarters of corporations will use IP VPNs for at least some remote access.

But SSL-based offerings have a long way to go before they undercut IPSec, says Steve Harris, an analyst with IDC. The major contenders in VPN technology are IPSec, Layer 2 Tunneling Protocol and Point-to-Point Tunneling Protocol.

"[Use of] IPSec definitely blows the others away," Harris says.

While SSL-based offerings promise lower administration and maintenance costs, the products aren't inexpensive. Neoteris' Instant Virtual Extranet appliance costs between $15,000 and $100,000, depending on the number of users. VPN gateways start at less than that and range higher in cost, depending on their capacity.

The SSL products do not address all the uses IPSec VPNs do, vendors readily admit. "We can't run applications and we can't update files. That's what VPNs do," says Robert Marmon, CEO of NetSilica, a start-up scheduled to launch its software next month.

NetSilica relies on the secure HTTP Web protocol, so its software can't handle client/server applications that aren't Web-enabled. IPSec, on the other hand, can support client/server applications because it transports the packets over legacy interfaces.

For end users who need to access their client-server applications, Finisar still uses its NetScreen VPN gear, Wilson says, because Neoteris cannot handle them.

Still, he transitioned 210 users from an IPSec VPN to SSL secure access via Neoteris, eliminating the work of managing that many IPSec clients, he says.

Some Web-based VPN products will support non-Web applications, but it requires extra work to write customer interfaces for each application. Netilla's offerings will handle client/server applications but will require custom Java development, says Jim Slaby, an analyst with Giga Information Group.

Netilla describes its software as middleware analogous to Citrix in that it also uses terminal server capabilities found in Microsoft, Unix and Linux servers. Netilla Service Platform uses SSL to connect remote PCs to a Netilla server that translates the secure HTTP Web traffic to the protocols supported by the terminal services on the corporate servers.

Products from Netilla and the like are particularly well-suited for setting up secure Internet links to share data with business partners. "The issue with IPSec is not that you can't build a tunnel between your gateway and some other guy's gateway. [Rather], it's convincing their IT security director to let you through his firewall with your tunnel," Slaby says. ■

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Wireless

continued from page 8

vice president of marketing for Megisto.

Megisto, founded in May 2000, is taking on a big project. In effect, it's creating the hardware and software infrastructure that will let carriers and mobile operators use several wireless technologies to connect hundreds of thousands, even millions, of mobile subscribers to IP data services from the carriers, and from carrier partners.

The management team has technical and marketing experience with such companies as Ericsson's IP Infrastructure Division, Bell Labs and Advanced Switching Communications. Robert Pavlak, vice president of engineering formerly with Bell Labs, has been involved in developing GSM and 3G Universal Mobile Telecommunications System technology.

Investors such as Columbia Capital, Bessemer Venture Partners, and Lucent Venture Partners have shelled out about $50 million in funding.

The first Megisto gateways will ship later this year. ■

Another IPSec VPN alternative

While some vendors are threatening IP Security VPN dominance on the remote access front, newcomer Flatrock is trying to horn in on the site-to-site connectivity side of the business.

Flatrock's provider access router (PAR) or subscriber access router (SAR) hardware sits at each branch site and at a central site, creating secure IP tunnels that can support simultaneous sessions between end-user machines. Flatrock keys in on using this to quickly create connections with business partners, something it calls instant extranet.

Unlike IP Security (IPSec) gateways, these devices automatically translate private IP addresses of the end machines into public addresses. This translation does not require changing firewall settings as does IPSec, and that can save administrators time. Network address translation is a complicated procedure that the Internet Engineering Task Force is trying to standardize.

SARs and PARs also don't disrupt the security your business partners already have in place.

Flatrock's devices establish one secure tunnel shared by users and applications at each end. The SARs and PARs can be configured to limit the bandwidth each session gets so no one user or application grabs more than its fair share.

This is performed by adding a Flatrock device to the LAN at each site but otherwise leaving the LANs unchanged. Each SAR is provided with a range of private IP addresses and associates each with an application or data source at another site. Local machines access these servers by calling on the appropriate local IP address. The SAR and PAR spoof IP addresses to make end devices think they are on the LAN, setting up subtunnels across an encrypted User Datagram Protocol connection. SARs and PARs can use Triple-DES or Blowfish encryption.

The company, which started up about two year ago, is launching itself this week, funded by $5.3 million from Guide Ventures, Digital Partners, Cascadia Pacific and High Bar Ventures.

While focused on site-to-site connections now, Flatrock plans to expand to remote access connections that will take advantage of browsers — even more competition to IPSec products.

Available now, SARs cost $6,000 and PARs start at $30,000.

— Tim Greene

■ **Network World**, 118 Turnpike Road, Southborough, MA 01772-9108, (508) 460-3333.

Periodicals postage paid at Southborough, Mass., and additional mailing offices. Posted under Canadian International Publication agreement #0385662. Network World (ISSN 0887-7661) is published weekly, except for a single combined issue for the last week in December and the first week in January by Network World, Inc., 118 Turnpike Road, Southborough, MA 01772-9108.

Network World is distributed free of charge in the U.S. to qualified management or professionals.

To apply for a free subscription, complete and sign the qualification card in this issue or write Network World at the address below No subscriptions accepted without complete identification of subscriber's name, job function, company or organization. Based on the information supplied, the publisher reserves the right to reject nonqualified requests. Subscriptions: 1-508-490-6444.

Nonqualified subscribers: $5.00 a copy; U.S. - $129 a year (except Washington, DC.$136.74); Canada $160.50 (including 7% GST, GST#126659952); Central & South America - $150 a year (surface mail); Europe - $205 a year (surface mail), all other countries - $300 a year (airmail service). Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin. Please include mailing label from front cover of the publication.

Network World can be purchased on 35mm microfilm through University Microfilm Int., Periodical Entry Dept., 300 Zebb Road, Ann Arbor,Mich. 48106.

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BackSpin Mark Gibbs

Let's do IT with a dongle

If I build something physical, say a chair, and you steal it, I have lost the benefit of my labor. Now I think no one in their right mind would suggest such an action is ethical or defensible.

But if I build a piece of software and you take a copy without paying me, there are many people who would not judge your actions as harshly as your theft of the chair. "Well," many would say, "it is just software, not a real thing like a chair."

But the reality is that the theft of the software represents a real loss to me. The fact that I can make an infinite number of identical copies for next to nothing is irrelevant. The work of creating the software was every bit as real as the work I put into making the chair, and my rights to my creation and the profit from it should not be violated.

So given that there is a prevailing sentiment that software theft is somehow OK and many otherwise ethical people share and act upon that idea, it seems we need to address the problem in a practical way.

If we don't do something concrete, there will be consequences. These consequences could well be increased software prices for "quality" titles, a reduction in the number of vendors (not enough money to go around), a drop in software quality because of lack of competition (although many might argue that this already has happened), and increasingly Draconian laws that address the vested interests of lobbyists but don't address the real problem and just make life harder for law-abiding IT folk.

After all the commentary I have read by industry pundits and vendors and the feedback I have received from readers concerning Microsoft Windows XP product activation and software piracy, I have come to the conclusion that there is only one solution: We need to return to dongles.

For those who don't recognize the term, a dongle is a hardware device that attaches to your computer to provide a physical confirmation that you have the right to run a specific software title.

Dongles fell out of favor some years ago because users complained that the devices were clumsy. Today, only a handful of vendors use this technology — AutoCAD is a prime example — and while there are problems, the system seems to work well enough for those products that use it.

The great thing about dongles is that a lot of the messy business of establishing your rights to use a product is eliminated by having to possess a physical "thing." Yeah, I know that bogus dongles could be made but I'm thinking that the dongle would have content or even onboard processing to make forgery orders of magnitude more difficult.

So here's my thinking: We need an open standard for a dongle mechanism that attaches to PCs to provide the authentication required to run a given software title. The dongles could be plugged into a reader attached to a Universal Serial Bus port, and adapters to convert USB to serial or parallel ports for non-USB equipped machines could be supplied.

The dongle would have to be quite small, as the system would have to be capable of supporting hundreds of them — Dallas Semiconductor's iButton (www.ibutton.com) looks like a promising technology for this.

The dongle could be as simple as a read-only device containing a license key or as complex as the Dallas Semiconductor Java-Powered Cryptographic iButton, which could even provide the PC with portions of the application to be run.

This would be simple for end users. Want to install an application on multiple machines? Go ahead. To run the application, just plug in the dongle. Vendors could let users merge dongles so a single dongle could service multiple applications.

This would require a set of underlying industry standards to make the concept practical. It would also require the support of rational, ethical users to drive its acceptance. Does that include you?

Cries of fury or applause to nwcolumn@gibbs.com.

'NetBuzz News, insights, opinions and oddities

Paul McNamara

Trustworthy? . . . Microsoft?

Bill Gates' call for his Redmond charges to adopt "trustworthy computing" as Microsoft's credo is bound to generate cackles of derision.

After all, we've heard this type of promise from Microsoft before, including most recently the "Secure Windows Initiative" announced last April and the "Strategic Technology Protection Program" ballyhooed in October.

Still, there may be value in having the boss stick his neck out in such a high-profile manner.

This latest pledge is at least a tacit acknowledgement that until now the company's software development practices have been anything *but* trustworthy. Buzz may be no theologian, but he knows full well that admitting one's sins is the first step toward redemption.

However, talk costs virtually nothing at a company with more marketers than you'll find on Madison Avenue.

Delaying a major software release long enough to plug security holes, on the other hand, can be extremely expensive.

Microsoft didn't acquire its reputation for leaky workmanship overnight or through only a handful of security gaffs. So only time — lots of time, as in years — and a good, long string of impenetrable releases will convince the legions of skeptics that Gates is willing to pay the price to back his talk.

An ode to the lowly site map

Web usability guru Jakob Nielsen has his critics, and not all of them are prima donna Web designers put off by Nielsen's keep-it-simple mantra.

However, even Nielsen's detractors will have a difficult time finding fault with his latest report on what should be a must-have if somewhat boring staple of any friendly Web destination: a site map.

"Most site maps fail to convey multiple levels of the site's information architecture," Nielsen writes in a recent AlertBox column. "In usability tests, users often overlook site maps or can't find them. Complexity is also a problem: A map should be a map, not a navigational challenge of its own."

Nielsen's research shows that slightly less than half of all Web sites include site maps — a shockingly low percentage given the utility these maps offer, especially to that most precious of 'Net commodities: the potential paying customer.

"A site map's main benefit is to give users an overview of the site's areas in a single glance by dedicating an entire page to a visualization of the information architecture," Nielsen says. "If designed well, this overview can include several levels of hierarchy, and yet not so big that users lose their ability to grasp the map as a whole."

Nielsen's 58-page report on site maps — including 30 design guidelines — is available for $58 at www.useit.com.

VC game has gotten brutal, all right

It wasn't that long ago that a marquee frontman with a handful of Internet-related business plans could convince eager investors to pony up endless millions in venture capital faster than you could say "dot-com revolution."

Back in the heady days of 1999, former Netscape CEO Jim Barksdale had little trouble raising $180 million for The Barksdale Group's first — and ultimately only — venture fund. The firm had little trouble doling out the dough either, as it is fully invested in the likes of TellMe, Slam Dunk Networks, Kontiki, Neoteris and Loudeye.

However, earlier this month Barksdale pulled the plug on his group rather than undertake the now-daunting challenge of raising a second round.

Can't pin this one on Microsoft.

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